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December 2002

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12



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Dell™ recommends Microsoft® Windows® XP Professional for Mobile Computing



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DELL5493/APC/GSP/PRD/11/20

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Play to your heart's
content thanks to
the seriously
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LEADS MANAGEMENT

All three packages can modify the standard forms designed to keep track of sales opportunities so that they can be converted into closed sales. You can also create new forms to suit your needs, and use a "sales pipeline" to create a graphical representation of the number of sales opportunities at each stage in the cycle.

But Legrand is the sales champ here, as its numerous tabs and fields offer a multi-faceted view of each opportunity in a single screen; you can also filter the records by many fields.

Verdict >>

ACT! ●●●○
ContactTracker ●●●○
Legrand ●●●○

CAMPAIGN MANAGEMENT

Legrand also leads when it comes to tracking marketing campaigns and measuring their performance.

Both ContactTracker and Legrand let you capture the campaign name, target audience, start and end dates, but Legrand sprints ahead with a richer set of fields such as campaign cost, estimated revenue, objective, targets, respondents, tasks, notes, sales opportunities and so on.

Disappointingly, ACT! fails to offer any campaign tracking facilities — the best you can do is attach a spreadsheet.

Verdict >>

ACT! ○○○○
ContactTracker ●●●○
Legrand ●●●○

CONNECTIVITY

ContactTracker is the winner here, with features ranging from phone book and SMS synchronisation with your mobile phone to full database replication and synchronisation, even over the Internet.

There's also the ability to display key information live from an external package, typically accounting software — so that, in addition to seeing a contact's details, you can also inspect the amount of money they owe you and what transactions they have recently performed.

A comprehensive wizard in ACT! helps you choose not only what data you wish to synchronise, but how (via email, modem or a shared network folder), as well as setting up a regular synchronisation schedule.

Legrand restricts itself to the most basic aspect of synchronising your data with another user over the network.

Verdict >>

ACT! ●●●○
ContactTracker ●●●○
Legrand ●●●○

THIRD PARTY SUPPORT

To help get the most from any CRM package you'll want to consider everything from the availability of templates and plug-in modules to customise the software for your specific industry, to the availability of training and even tips from a community of fellow users.

As you'd expect, a veteran such as ACT! is extremely well supported, with everything from books and certified consultants to trainers and user groups.

ContactTracker already boasts a growing number of trainers, as well as tools such as ACT! add-ins.

Legrand claims over 80 certified business partners, with add-ins noted to appear for computer telephony and job quoting.

Verdict >>

ACT! ●●●○
ContactTracker ●●●○
Legrand ●●●○

APC'S CONCLUSION ...

Overall, all three CRM applications ranked close together, with obvious strengths and weaknesses in different areas.

ACT! is best at the basics, perhaps because of its pedigree in the market — they've had a long time to get the foundations right, and it shows. That same factor lends itself to a strong third party market, but if your work is going to be campaign-based, give ACT! a miss.

Legrand stands out in management aspects — it equalled or beat ACT! and ContactTracker in working with leads, managing campaigns and putting all of the customer data together in a single super-informative view.

ContactTracker strikes a comfortable middle ground between ACT! and Legrand, provided you are able to live with its shortcomings. **ETIT**

Details >>

ACT! 6.0

Contact Interact
Phone 1800 675 617
Online www.act.com
Price \$249 (six user pack, \$1,245)

CONTACTTRACKER 1.0

Contact VitalSoftware
Phone 1300 850 091
Online www.vitalsoftware.net
Price \$293 (five user pack, \$1,099)

LEGRAND CRM 2.0

Contact Legrand Software
Phone 1300 132 890
Online www.legrandsoftware.com.au
Price \$249 (five user pack, \$814)

	ACT!	ContactTracker	Legrand CRM
Basics	4	3	2
Data import/export	3	3	3
Customer view	3	4	4
Leads management	3	3	4
Campaign management	0	3	5
Connectivity	3	4	2
Third party support	5	3	3
Totals	21	22	22

► **Try before you buy:** the best way to assess which of these CRM packages is suited to your needs is to weigh the scores based on which features are most important to you, and to install the trial versions (included on this month's cover CD).

DATA IMPORT/EXPORT

It's almost certain that you have customer data in another application which will need to be imported into your CRM package. You may also need to export data to send to associates who may be using another product.

The lowest common denominator is delimited text files (using tabs or commas to separate each data field), and all three of these programs do that well enough.

ACT! supports an odd set of import options, ranging from dBASE and Outlook to Symantec's Q&A database. A Q&A database of some 6,000 names was sent through and, while the process was slow, it worked. Export options are restricted to ACT! or a delimited file.

Legrand also allows data import from Microsoft Outlook, as well as the financial programs MYOB, Pastel, Sybiz and FinancePlus.

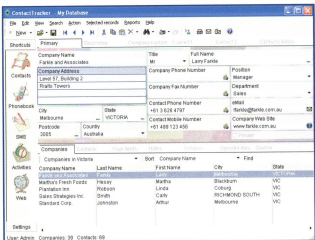
ContactTracker is a mixed bag. While it skips Outlook as an import source — focusing more on competing CRM applications such as ACT!, Goldmine, Maximizer and Tracker (as well as any dBASE database) — it also supports Microsoft Access and SQL Server. Exports are limited to dBASE and delimited text files.

ContactTracker also ships with a desktop edition of Microsoft SQL Server, for use in a multiuser networked environment. APC tested this against an Access database containing 60,000 records in multiple tables. An import map was set up, then the button was hit and we waited — for over six hours, at which point the program had ingested only one-third of the entire dataset.

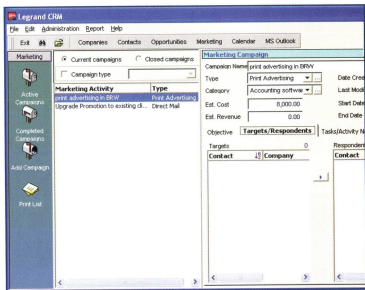
However, ContactTracker wins points for its ability to import text that requires special handling. For instance, when importing a list which contains full names in a single field, you could have the first word in the field dropped into the program's First Name field.

Verdict >>

ACT! ●●●○
ContactTracker ●●●○
Legrand ●●●○



Keeping track: if you can stand the gaudy water-coloured interface, ContactTracker will impress with its wide range of connectivity options.



Grand plan: Legrand CRM 2.0 excels at managing sales and marketing campaigns, as well as keeping on top of leads.

CUSTOMER VIEW

There's no use having reams of rich data on your customers if you can't get to it quickly and easily. Ideally, you need to know which individuals work for the same company; who said or wrote what to whom and when — and for this "360 degree view" to be a single click away.

ACT! falls short here, because it's more centred on the individual, so there's no "organisational" view of your contact records. You can, however, define an unlimited number of custom fields, rename 15 user fields and redesign the layout of the screen. Keyword searching is available and if you know how to use boolean operators, you can build your own query.

ContactTracker does a better job of viewing both companies and individuals, lets you define an unlimited number of user fields and, in a feature that may provide vital to some, is the only program in the trio that can handle Unicode text such as Chinese.

Legrand can likewise show both companies and individuals, with 19 unique user fields, plus it has the ability to rename most of the existing fields to suit your needs. You can also assign keywords to records for ease of retrieval.

The simplicity of its plain-text search dialogs is very appealing too. There is detailed accounting information about records, such as payments received to date.

Verdict >>

ACT! ●●●○
ContactTracker ●●●○
Legrand ●●●○



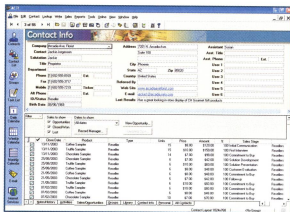
Affordable CRM

Is customer relationship management software finally ready for the rest of us? Ash Nallawalla puts a trio of fresh-baked entry level CRM packages to the test.

For almost as many years as enterprises have been spouting the benefits of customer relationship management, vendors have been promising that CRM software was ready to conquer the desktops of small businesses and workgroups.

The pledge is simple enough—the specific form of data mining provided by CRM software lets you treat your customers better, not just better than you currently do, but better than the competition treats them.

Can they live up to their word? To find out, we gave the very latest versions of ACT!, ContactTracker and Legrand CRM Standard Edition the chance to strut their CRM stuff in seven key areas.



► **Program with pedigree:** ACT! has developed its excellent interface and solid set of contact management features over a number of years.

THE BASICS

CRM software has to make it easy to manage data relating to individuals and companies, as well as help manage your time. There's also the need to integrate with Microsoft Office (especially Outlook), which most businesses already run, and to let the user compose a letter, fax or email directly within their CRM package.

ACT! 6.0, ContactTracker 1.0 and Legrand CRM Standard Edition 2.0 all do a good job of displaying records and are integrated with Microsoft Office to varying degrees. This means that Word and Outlook can be accessed through the products' interfaces.

ACT! offers its own workmanlike word processor and email client, so you don't even need to own Office. It can also use Outlook Express as an email client. Documents created with Word are saved as normal documents, but are linked to the individual's record.

Legrand uses Word for mail merge only, while ContactTracker also enables you to create standard documents. But only ACT! lists the documents relating to each contact.

Verdict >>

ACT! ●●●●○
ContactTracker ●●●●○
Legrand ●●●●○

Try before you buy

This month's cover CD contains trial versions of ACT! 6.0, ContactTracker 1.1 and Legrand CRM 2.0. There is also a full working version of ACT! 5.0.



On Test

Reviews, First Byte, Tech Briefing, Real Deal, Labs Challenge

Reviews



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Affordable CRM

Is customer relationship management software finally ready for the rest of us? Ash Nallawalla puts three new packages to the test.



34 Dell Dimension 8250 3GHz

First off the blocks with the Hyperthreaded Pentium 4 3GHz; plus, how AMD's Athlon XP 2800+ stacks up against it.

36 Microsoft Digital Image Pro

Microsoft's mid-range image editing program is gunning for Photoshop Elements.

38 Toshiba Satellite 2410

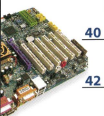
Keen price, sharp performance and sensible design puts the Satellite 2410 into orbit.

40 Primera Bravo Disc Publisher

Automated CD burning and printing for your desktop.

42 Gigabyte GA-8PE667

This near-perfect motherboard is let down by mediocre onboard audio and lack of AGP 8x.



44 Palm Tungsten T

Take Palm OS 5, add a fast ARM processor and vivid colour screen, then toss in a Bluetooth chip: Palm's new handheld is ready to rock.



46 PowerQuest Partition Magic 8

Despite making partitioning easier than ever, the lack of new features means this latest version of Partition Magic 8 is not a must-have upgrade.

46 Norton Ghost 2003

The latest version of this popular disk imaging software fails to shed its DOS legacy.



48 LaCie d2 external hard drive

Running out of hard disk space? LaCie's d2 delivers an instant 120GB hit through USB 2.0.

48 Maxtor Personal Storage 5000LE

Back up your precious data to this 80GB external drive with the push of a button.

50 Creative Nomad Jukebox Zen

Creative's answer to the Apple iPod leaves APC wondering: what was the question?



50 Microsoft Wireless Optical Desktop

Microsoft cuts the cables and adopts Bluetooth for its new cordless keyboard and mouse combo.

First Byte 54

Our first look at the newest gear: Toshiba's Pocket PC e330, Creative's Sound Blaster Audigy 2 audio card, the Canon Digital IXUS V3 and more.



Real Deal 58

Is Microsoft's Tablet PC ready for the mainstream? More to the point, is the public ready for the Tablet PC? We don't think so...

56 Tech Briefing

Hyperthreading

Intel's parallel processing technology explained.



Labs Challenge 62

19in CRT monitors

Life on the big screen never looked so good as we put 14 monitors to the test.

USB memory keys

Go-anywhere storage on a stick!



Need to Know Epinions

Agenda: your place to vent

bigpond.com, so it would be nice to have a list of URLs that I could edit.

David Miller
Via email

BROADBAND REDEMPTION

APC interviewed me for its April issue (page 12) about Telstra's service, and it was pretty obvious I wasn't happy. After the interview I utilised Telstra's "give up on us now and pay no more" fall back option for those who thought Telstra charge too much (after the price rise). So I changed ISP and chose Always On Line. I feel so much better with them as I can ring up and a person answers and I can say: "Hi Mike, it's Tim." He replies "Hi Tim, how's it going?" I don't sit in a queue for hours, I don't suffer costly delays. I get personal service immediately.

Since then, the worst problem I had with my service was when Telstra changed the server I log on through, but didn't bother to tell my ISP (so I had to experiment). Service is slower now (or I think so) as a result of Telstra screwing with it, otherwise, Always On Line's service has been totally uninterrupted and essentially cheaper and more reliable than Telstra's.

If you're with Telstra for broadband, shop around. There are many cheaper (or same price) and faster alternatives, where you get treated like a friend instead of a number or a "customer".

Tim Keown
Sydney, NSW

IT'S ALL ABOUT ME

Last year I bit the bullet and "upgraded" to an Optima MyPC. It was a package deal from Dick Smith Electronics. So what is my beef? The computer came with Windows Me.

I have no control over which OS is currently in vogue and I'm therefore stuck with that OS. I find Me very frustrating at times. It will "crash" or "freeze" for no apparent reason that this novice is aware of. It seems to have a mind of its own. Here are some examples.

Early this year, the Control Panel had no icons on it — the screen below the address bar was just blank. I finally managed to get in touch with Optima and when it eventually handed

on them that I could not make a boot disk, they were good enough to give me one. I was very grateful and told them so.

Windows Me does not remember all that it's told. I am not sure how to explain this. I have to keep resetting things all the time. With the Amiga I only had to set something once, and unless I wanted to alter a Preference, the computer always obeyed that command. Seems to me that with Windows Me I have to tell it every time. The fact that I have to press Apply all the time gets on my goat, too. Forget to press Apply and you can forget what Preference you gave it.

There are times (touch wood, it hasn't happened for months) when, after the Computer has switched off, there is a cursor in the top left-hand side of the screen blinking away. I left it on all night one time. It was still there the next morning.

Anyway, enough of my moaning. As I said at the beginning, the buyer is stuck with whichever OS is installed. If they do not like it, they have to fork out for a different OS. No wonder Bill Gates is so rich.

One other moon. APC and your competitors all seem to treat Me like the Ford Edsel. It exists but you wish it didn't. You do not appear to have many articles on Windows Me.

Michael G. Wilcox
Via email

As a minor overhaul of Windows 98, Me was barely a blip on the OS radar compared to Windows 2000 and XP. That said, if you're hankering for more Me-specific coverage, drop us a line.

KUDOS FOR APC OCTOBER

Rarely has there been an issue of your magazine or any other magazine (which I get a number of, but keep coming back to APC) that has been so practical and useful for me than the October issue. I have found an enormous amount of the software valuable, particularly the full copy of Norton Utilities, Winamp 3, Windows 2000 SP 3, BootIt Next Generation and the variety of boot disks. I do a great deal of fixing computers for friends and school and the boot disks were very valuable.

Your article about software that does not work on the latest versions of Windows (APC October, page 122) made me laugh. Was it only the early 1990s that I faced a similar problem with some network software that would not run on DOS 6?

The solution? Write a small line in config.sys that made the software think that it was running on DOS 5. Does this indicate that with all the money thrown at Windows, some of the simple problems of the past are still with us?

Peter G
Via email

Prize Pit

SUBSCRIPTION WINNERS

Each month APC gives you the chance to win free goodies if you become a subscriber. See page 106 for details.

October winners are N H Thies of Warrnambool, Vic and P J Smith of Caloundra, Qld. Both have won a Handspring Treo 180 Communicator with FileMaker Pro software. This package is valued at \$2,000.



I run SuSE Linux on another drive and I love the OS environment, but I am tied in so many ways to Microsoft and its bugs. Star Office 6.0 is a step in the right direction and I was pleased to see some devotion to Linux in general and Lycoris Desktop/LX looks interesting. If only people would experiment a little then maybe the "Microsoft Giant" would take more time to make its software as bug-free as possible before releasing it, instead of trying to be first to release and have another OS every year or so.

And I would like to applaud all those software developers who write truly free software. There is some excellent software out there if you are willing to search and your magazine has found many great titles that I use often. It's nice to know not everyone is hungry for the big dollars.

J Blanch
Via email

Have your say

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She wears
the MV550i digital video camera.
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Mini DV

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Advertisers' benchmarks?

As a long-time APC subscriber I have always appreciated your benchmarks, especially the annual PC test. APC November, however, gave me the numbers to back up a nagging irritation I have had with your tests. Many of the products advertised in the magazine do not feature in your tests, so I am always left wondering how they would compare.

In your recent PC test, for example, only one-third of the brands advertised in your November issue were tested and even less, about one-fifth, of the models advertised featured in your test. Given your spray against companies that could not be bothered to supply test machines (page 124), it makes me wonder about some of your advertisers. The phenomena is not limited to your PC tests. None of the seven Web hosting companies tested in the same issue advertised in your magazine. The five who did advertise were not included in your test.

I realise that this may well be outside the control of APC when you rely on supplied product, but for the computer buyer (who you'd think are the people advertisers are trying to reach) it's very frustrating. Maybe some of your advertisers will take note of this letter and supply products for testing next time?

Mark Spencer
Sydney, NSW

PERSONAL PREFERENCE

I am wondering if you really are APC or not? In your October issue we get the following: Managed PCs, NAS systems and PDAs. Are these articles relevant to the home PC user?

I'm also in complete agreement with Paul Budde, who said that broadband needs to be available everywhere and at a reasonable price. I have friends in Kentucky who have cable TV/Internet supplied by their local electricity company, all paid on one bill.

In little old New Zealand, ADSL is called

Jetstream and runs as fast as your ADSL connection can go — which can be as high as 1.5Mbit/s for incoming data.

For home use it costs NZ\$64.90 a month for 5GB downloads outside NZ (unlimited in NZ). Compare that to a locked contract for X months here in Australia. I remember talking to friends in the United States back in 1996. They had unlimited ISDN time/downloads for US\$45 a month, when we thought AU\$25 was a good deal with the really fast 33.6K modems.

What I am saying is that here in Australia we are being forced into using Telstra or Optus broadband, or nobody at all if you live outside the capital cities.

Tim M
Via email



APC's readership is fairly broad, Tim, and it includes IT professionals at work as well as "power users" and enthusiasts at home. For this reason we aim to ensure that each issue of APC has content to engage all readers. For IT professionals, NAS boxes and managed PCs are bread-and-butter stuff; and handhelds are probably more popular in the "personal" space than businesses, so they're certainly relevant to the home users. That still leaves plenty of pages for us to tackle core hardware and software reviews, meaty features and our popular Workshop articles.

DIALLING BACK THE SPAM

Most spammers change their sender's address each time they do a mailing. Adding the sender to the Junk Senders list in Outlook and other email programs is a waste of time, because their next spam will come from a different sender's address. What I would like to do is change Outlook's Junk Senders list so that it bans every email from the URL. There are a couple of notorious spamming URLs around, such as china.com, and I would be happy never to receive any email from any sender at that address ever again.

Sure, I would not want to ban all email from

I was very pleased to see your thorough article on the usage of GNU/Linux in enterprise and government sectors last month, but I noticed a disturbing omission. The main reason most governments have decided on free software is due to the freedom it provides them.

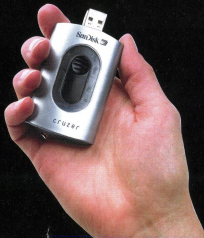
The point was made that the usage of free software (called open source by some) results in major cost savings and provides technical benefits in certain cases, but this may confuse people who know that project bids are definitely not decided on a lowest-cost-wins basis.

What free software provides is much more than this. It provides an organisation with independence from a single vendor. It provides greatly increased interoperability due to open code and common standards. It removes the possibility of being forced to buy expensive upgrades just to keep your business running. It means your IT department is once again a department of people being paid to add value to your business instead of a big black hole of licensing expenses.

This is the reason why countries and smart businesses are turning to free software, not just to save a few hundred dollars at the store.

Nick Seow
Sydney NSW

SAVING A FEW HUNDRED DOLLARS at the store is just what Nick Seow's comments on free software have accomplished. Nick's APC Letter of the Month entry wins him a Cruzer USB Flash memory reader, accompanied by a 128MB SD card, courtesy of FlashMemory (www.flashmemory.com.au). The prize is valued at \$233.





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Need to Know Watchdog

Demand and suppliers

Supplier, distributor or reseller . . . who will assist when you need high-tech help?

Dear Watchdog,
I decided to rebuild my server so I could separate my IT studies from everything else. After installing my new hardware I went to update the BIOS on my Gigabyte motherboard (GA-72XR Version 1) as well. I opened the Gigabyte automatic update utility on my PC and it searched and installed the latest version, which it listed as "f9". Suddenly, I lost the dual BIOS feature.

Still with half my dual motherboard working, I went to www.gigabyte.com.tw where the latest BIOS for my board was listed as version "fa". But when I ran this, my whole motherboard totally locked up. I phoned Gigabyte in Taiwan who just kept telling me to re-flash the BIOS. I can't do this because the system is dead!

The company said I should contact one of its Australian distributors, a Melbourne company called Hallmark. Hallmark said it'll fix it — for \$60. I find this hard to swallow because I used Gigabyte's utilities and closely followed its instructions.

*Ken Fidler
Alice Springs, NT*

Ken's warranty had recently expired so he didn't return the motherboard to the retailer he purchased it from. He wanted Gigabyte to help him since the problem arose when he used the product update on its Web site. However, Gigabyte is based in Taiwan and they use a network of third party distributors and resellers in Australia. Watchdog approached Hallmark with Ken's concerns.

Dear Watchdog,
Mr Fidler's case raises commercial and technical issues that all buyers should consider when selecting a vendor or considering overseas supply. Although Hallmark is not a party to any business with Mr Fidler, we have attempted to help him through this matter. The facts are that Mr Fidler has not proposed that his

purchase was with Hallmark or one of its resellers. Mr Fidler contacted us as we appeared at the top of a list of Gigabyte distributors, not on recommendation by Gigabyte as its warranty centre for his particular case.

Hallmark is a Gigabyte service and warranty centre for Gigabyte products bought from Hallmark or its resellers. For customers like Mr Fidler who buy a Gigabyte product from another vendor and have a problem, we offer our technical services at a reasonable rate.

This incident is not isolated and I'm sure there are other readers who have had a similar experience when buying overseas-sourced product. The question of course is to whom do you turn for local support? Hallmark's advice is to buy your goods from a reputable local dealer which has a good relationship with stable, well-established local vendors like Hallmark.

*Andrew McLorinan
Hallmark General Manager*

Was there anyone in Australia Ken could turn to? Watchdog contacted Gigabyte in Taiwan and it agreed to look into his case.

Dear Watchdog,
Many thanks for giving us the opportunity to explain in more detail our Dual BIOS function. According to the limited information, we can only assume that the first time he [Mr Fidler] flashed the BIOS, the operation failed and it damaged his main BIOS.

For the second time, the operation failed again due to unknown reasons. It damaged the backup BIOS therefore the motherboard cannot operate normally.

There's a simple procedure to fix it when it happened the first time. Ken

could recover the main BIOS by copying the backup BIOS to the main BIOS. After doing so, he may flash the BIOS again if he wanted.

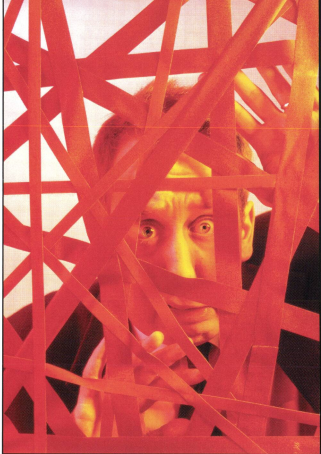
Actually, it's very difficult to duplicate Ken's environment, so I'm afraid we cannot really tell you what happened to his motherboard in this case.

*Amos Lee
Gigabyte Technology, Taiwan*

Although Gigabyte wanted to help, it was half a world away. The company asked Watchdog for Ken's contact details and they were able to trace the distributor that had shipped Ken's motherboard. It arranged to fix the dead system and Ken was saved from paying the extra service fees.

Contact us

WE WANT TO KNOW
how IT companies are really treating you. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 1028. Include your full contact details and any product information. All correspondence becomes the property of APC and is subject to editing.





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RaQ550	1gHz	256MB	40GB	\$1,649	\$5,490
RaQ550	1gHz	512MB	2x80GB	\$2,249	\$7,490

Dell PowerEdge 1650 with Redhat Linux

model	RAM	hard drive	quarterly	annual
Piii 1.13 gHz	256MB	18GB	\$2,500	\$8,600
Dual Piii 1.13 gHz	512MB	2x18GB	\$3,300	\$11,300

Dell PowerEdge 1650 with Windows 2000

model	RAM	hard drive	quarterly	annual
Piii 1.13 gHz	256MB	18GB	\$3,000	\$10,200
Dual Piii 1.13 gHz	512MB	2x18GB	\$4,000	\$13,600

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Gates' DRM agenda stinks

Copyright protection? No worries. Stick with Windows Media and the world will be secure.

In 1995, Bill Gates whiffed a problem. It stank up the Redmond campus like the morning after a vinaloo and 10 beers. And it wasn't the buried companies squeezed out of the market by Microsoft's might and divine right. The problem that Bill sniffed was Microsoft's own rotting carcass, and the Internet was its compost. Almost overnight, he changed the direction of the company and quickly made Microsoft into an Internet company, with Windows 98 marketed as the first Internet-friendly OS. If Gates had ignored that smell, Microsoft would be finished today.

And today, the pong that's wrinkling the nose of the world's richest man is a seemingly harmless acronym that will become the most important initiative for 2003, and change computing as we know it. DRM, or digital rights management (see page 114 for an overview) is rapidly moving to the top of Bill's list of priorities.

At its simplest, DRM is the encrypting, distribution and authentication of media prior to playback on your PC. To control the DRM agenda is to effectively control the future of media formats. And while pressure mounts from entertainment industry lobbyists and government legislators to provide greater protection for copyrighted media, Bionic Bill has a plan that will serve his company's interests on multiple levels.

At the same time it will affect how your PC handles music and video, the ability to share the media you own, and eventually the choice of media players available.

In October, Microsoft gave a glimpse of what's to come with its DRM software. A UK-based Digital Download Day was used to showcase "padlocked" downloads that involved paying

first times the company has actually innovated. For once, it wasn't behind the game and simply threw all its resources to catch up by targeting an enemy with extreme prejudice. This time Bill saw in advance which way the wind was blowing and steered his US\$38 billion cash-reserved boat in the right direction.

And without letting down his critics, BeeGee chose a direction that serves only Microsoft and infuriates his customers by not being interoperable with the common multi-platform environments. For their part, the content providers simply don't care as long as their works can't be pirated.

Microsoft is attempting to dominate the field with its new codec, the same way it did with IE — tying it to the OS and making it near impossible for competitors to get a foot in — so it will be interesting to see if DRM becomes Gates' next DOJ nightmare.

Observers smarter than Dispatch say that the end goals behind Microsoft's DRM are clearly designed to disrupt cross-platform environments that might, for example, mix Windows clients with Java and Linux servers. And Apple's head-in-the-sand approach to DRM will only further drive content providers into the bosom of Microsoft. By the time it wakes up and says: "we can do that in translucent plastic, man!" it will be too late.

The only hope on the horizon — and it's a dim hope unless some fingers are quickly pulled out of dark holes — is in the XMLCOP.org carrier, supported by Sony, Real Networks, IBM and others. But don't hold your breath. Like all slow-moving open standard love-ins, this is doomed because once content providers are hooked on Microsoft, they have about as much incentive to look at another solution as Internet users do of

Things aren't going to change because of stunts by a paranoid trillionaire who has a tanty whenever it looks like he can't control the tech ecosystem

nominal amounts of coin for secure music singles. Microsoft's DRM solutions are the only show in town at the moment and the entertainment giants are rushing to make their content DRM-enabled on Microsoft platforms — namely, making their works Windows Media-enabled.

Every artist and movie studio is lining up to encode their content with Microsoft's DRM solution. And the end result will simply be this — no media will be readable on your Windows PC unless it's encrypted with a DRM solution such as Windows Rights Manager. And no media will likely be encrypted with any other DRM solution because none will be ready in time.

Either way, your PC won't let you compress your music to any other format since the copy protected logo-bearing CD that you'll see in time for Christmas won't be read by any components in the PC — including the OS, CPU, or soundcard. (www.ifpi.org/site-content/press/20020917.html)

DRM is a milestone achievement for Microsoft. It's one of the

installing Netscape Navihwatever.

Don't make Dispatch say that Microsoft's version of Draconian Rights Managements is a cynical way to seed Windows Media codecs, and a foolish attempt to force users and businesses into deploying end-to-end Microsoft solutions, which will only further ignite the flames of considerable hate against them.

Or, that it's a company that endlessly misses the fact that interoperability between platforms is not just desirable for best practices in IT management, but simply the way it is. And that these things aren't going to change because of cheap stunts by a paranoid trillionaire who has a greed-motivated tanty whenever it looks like he can't get control of every facet of the technology ecosystem.

Because there is every chance that Bill is genuinely concerned about protecting copyright and just wants to do his bit in making sure digital rights are effectively managed. ...

gmontgomery@apcmag.com



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Burden of proof

Police rely on hacking victims having the correct procedures in place so they can detect, track and prosecute hackers successfully. There are four main steps you need to follow to effectively protect and gather evidence.

- 1 Log all internal and external network traffic.
- 2 Record logs directly to non-volatile media, such as CD-R.
- 3 Use an Intrusion Detection System, a firewall and update patches and antivirus software immediately.
- 4 Know your network. Train a staff member to monitor the system, identify a serious breach and institute an emergency shut down so the system cannot be used to hijack others.

increased funding for cybercrime units in the hope of deterring hackers. The type of attack suffered by Ausgamers — called a “308h” under the NSW Crimes Act — now carries a maximum two-year jail term. If they had inflicted damage, it could have reached 10 years. The legal status of benevolent hacking became even murkier when the new Digital Agenda provisions in the Copyright Act (similar to the Digital Millennium Act in the US) made it a crime to circumvent security features in order to break copyright. Now, even privately trying to crack digital security features could put you on the wrong side of the law.

Detective inspector Bruce van der Graaf, of the NSW Police eCrime unit, has spent a large portion of the last six months tracking hacking activity. Within the last two years, Australian police have arrested one school kid and some other young males who have just left school.

He says the hackers who have been arrested share many of the same characteristics. “What you’ve got is male, young, intelligent and having looked at some of their traffic, a questionable social life. The sort of guy who doesn’t really have much else to do. Sad cases really.”

“They might read that and get upset but how do you describe someone with nothing

better to do than sit up all night trying to break into other people’s computers?”

The police track hackers through reports from victims and some intelligence activity. The police do not disclose how they hunt hackers (offenders find out when they read their brief of evidence). “There are certainly a number of groups of dedicated hackers in Australia who routinely spend all night doing it,” says van der Graaf. “The guys who run their ‘interest’ sites don’t generally broadcast their activities...you don’t generally get into the chat room unless you’re invited. It’s our experience that they don’t trade their secrets openly.”

Van der Graaf scoffs at the excuse that hacking into a remote system is a form of research or improves security (would you believe a prowler who tried to explain they wanted to let you know whether your bedroom window was secure?). Other hackers test their skills against supposed paedophile rings — a vigilante approach that could undermine future prosecutions.

But a young holiday hacker, spoon-fed on Windows GULs, may never appreciate the damage they cause (like the four hours it took to rebuild the compromised Ausgamers server).

“What you call the script kiddie, they’re just young guys not well supervised in the home environment who are not really experts in security but who just run a few scripts which are automated; especially where businesses haven’t invested sufficient resources in keeping their system patched — that’s what happens.”

He says these people would not want to end up in jail. “They would certainly not enjoy the experience. So yeah, find something else to do in your spare time.”

FEARLESS

Generally, there is little fear of capture. The Computer Crime and Security Survey found most hacking activity goes unreported. Recently, Alaverdian was called in to run a complete forensic sweep across a client’s network. He gathered evidence and traced the attackers to Korea and China. Yet like the majority of victims, the business chose not to pursue them.

There is a pervasive attitude across the Internet that if you’re the victim of a holiday hacker then you deserve it. As Michael remarked, “If system administrators are worried about break-ins during school holiday periods because there are lots of bored children out there, then they should not be system administrators.”

The culture of shame and blame leads some systems administrators to cover up successful

hacks. A recent study by mi2g found businesses can’t update the flood of vulnerabilities without suffering severe downtimes. These vulnerabilities are easy to fix, but the short period between when the flaw is published and the user installs a patch is enough to do the damage.

Time zone issues also make it even harder for Australians. Ausgamers’ Adam Williams admits they were embarrassed to get hit. However, there was very little they could have done to stop it under the patch-reboot-patch-reboot regime demanded by today’s software. “I think break-ins happen a lot more than people say,” he says.

“Imagine if you were the system administrator of a large server farm and you were hacked. You may see it as not doing your job properly and therefore cover it up. I think that if people were more honest it would be better. We’d have a better understanding of what’s going on.” [ET12](#)

Links

INTERNET STORM CENTRE

<http://isc.incidents.org>

Supported by the SANS Institute, the peak association for security professionals, the site gathers more than three million intrusion detection log entries every day and displays a running total of the sources and types of attacks around the globe.

DEFACEMENT ARCHIVE

<http://alldas.org>

A comprehensive archive of defaced sites and a list of prominent hacker pseudonyms. At the time of writing, the .au domain had been defaced 471 times (1.3% of attacks). Windows systems had been defaced 20,484 times (56.4% of attacks) and Linux 8,447 times (23% of attacks).

AUSCERT

www.auscert.org.au

Independent security incident-reporting organisation based within the University of Queensland and Australia’s national Computer Emergency Response Team.

SNORT

www.snort.org

Free network monitoring, analysis and intrusion detection software.

for security firm Global Information Security Services Australia. "A lot of young male teenagers are doing this. I can say that during the school holidays there's a big increase. We see that all the time," he says. "The script kiddies do it for fun and out of curiosity. They read something and say 'this sounds interesting, I'll give it a try.' They don't really gain much out of it. There's a whole level of script kiddies who try to publicly deface Web sites and increase their status as hackers."

Most successful intrusions require no special expertise and follow the same pattern as the Ausgamers' hack. Viruses are also regarded as low-tech. Alavardian sees very little sophisticated hacking activity compared to the low-level nuisance probes that show up on their Intrusion Detection Systems (IDS's) each day.

He suspects there are only a handful of high-level crackers in the entire world (one estimate is

kiddies and the small number of sophisticated crackers are the increasingly marginalised hacking community. Before hacking became a dumbed-down, point-and-click pastime, hackers inspired respect. They were masters of a craft and custodians of secret knowledge beyond the comprehension of the rest of us.

MISUNDERSTOOD OR MENACE?

"Michael" (not his real name) has been a member of the Australian hacking scene since 1999. Now in his early twenties, he got into computers as a kid and now works in the IT industry. Michael views himself as a cutting-edge researcher in the field of security architecture. He uses phrases like "inspiration to learn," "thorough research" and "out of the box thinking."

For Michael the true hacker mission is to improve a system's integrity through rigorous testing. Hackers protect their anonymity because

developed by hackers or crackers. Enthusiast hackers are quick to distance their activities from malicious crackers and script kiddies.

"Hackers do not rate each other based on attacks, they show each other respect based on research and general willingness to learn," says Michael. "From Australia there is what I would consider a high proportion of hackers who are publicly known. Hacking is definitely not a phase, but cracking usually is."

"Amongst the crackers that I have met myself, there is no real way that I can classify their personalities or characteristics into a single group. A cracker is usually motivated by self-glorification. This can be seen because most crackers cannot keep the story of their successes to themselves."

Sarah Gordon, senior research fellow with Symantec's Security Response team, has interviewed crackers about what drives them. "Sometimes those who release computer viruses into the wild do not sense the reality of the impact upon real people. There is a disconnection between the computer activity and what is 'real'. Other times there is pre-meditated intent to cause harm, destruction."

Business, law enforcement and ISPs are attempting to put a lid on the increasing levels of "Internet noise" and chaos. The Internet Industry Association (IIA) is finalising an industry code outlining how ISPs trace and archive network activity for law enforcement bodies. Meanwhile, Telstra and OzEmail have tested Caller Line Identification (CLI) on calls made to their POPs so they can more accurately trace hackers to the source.

Australian federal and state governments have introduced harsher penalties and



There is a pervasive attitude across the Internet that if you're the victim of a holiday hack then you deserve it

up to a thousand). "I can say that black hat hackers are one step ahead of the rest of the world. And they're not the general 15-year-old teenager in their bedroom trying out new things. It's the really cleverly minded, the people who actually find these exploits and release the code."

He says sophisticated crackers don't use a public signature or nickname. "The profit is personal satisfaction; it's a motivation to beat the system. They do it just for themselves, they don't care what people think of them."

Caught between the rising tide of script

they feel misunderstood — not because they're malevolent. "I use the word 'underground' lightly since that would imply that they have some reason to fear us, or that we are a malicious bunch," says Michael. "But the simple fact is that due to the amount of politics and bickering within the Australian security and hacking scenes, we no longer have an open door policy."

Hackers discuss projects in forums and chat sessions. The script kiddies are the bottom feeders in the hacking food chain and spend their time gathering code-sets and tools

Profile of a typical intrusion

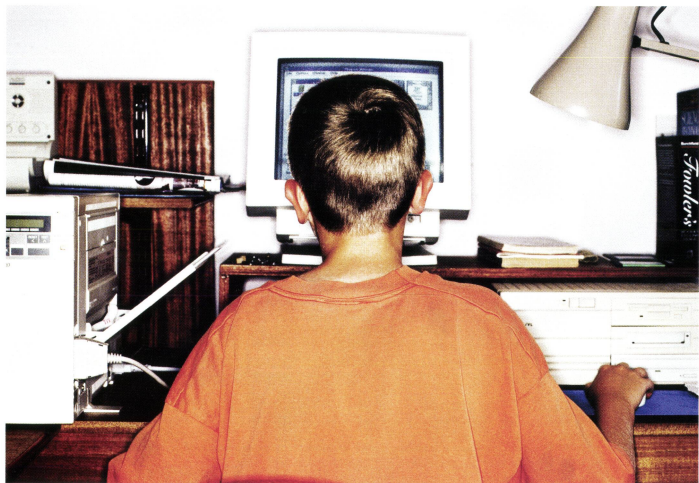
A typical hack starts with a guy, a computer, a Net connection and a bad attitude. A basic tool set includes some network administration programs and requires no intimate knowledge of programming or even command line code. They download a list of the latest exploits being discussed in hacking newsgroups or "security enthusiast" forums. They also keep a close eye on the latest vulnerabilities posted to security alert Web sites.

They choose an exploit they can run from their system (the majority of attacks involve

Windows, although more serious hackers will cover Linux, BSD, or enterprise Unix systems by running multiple PCs or VMware). They scan the Internet using an automated network mapping utility, such as Nmap or Dsniff. Armed with a list of potential targets, they hit each system. Depending on how "fresh" the exploit is, persistence will eventually expose someone who hasn't had a chance to install a patch for the chosen vulnerability. They also test servers for sloppy default installations, generic tutorial settings and obvious passwords.

Having gained root level access to the system, they have free reign to change information, copy credit card numbers, sabotage online orders, steal system resources or use your server to attack someone else. They upload a Trojan like Back Orifice so they can come back later. Then they manually delete the log file or run a log eraser such as Packet Scrubber so you can't see what they've done or where they've come from.

Once a server has been compromised, it has to be rebuilt from scratch.



Why holiday hacking is child's play

Combine holiday boredom with network-nuisance tools and you've got an administrator's nightmare, writes *Fiona Angus*.

Net users are bracing for a wave of hacking activity this Christmas as students take up rudimentary hacking techniques to alleviate school holiday boredom. Despite increasing vigilance by security professionals, ISPs and police, these Internet delinquents and holiday hackers continue to create havoc because system administrators are too embarrassed to report the crimes.

When Adam Williams, head of Ausgamers, discovered a hacker on one of its servers, it was more embarrassing than damaging. Instead of a well-planned and executed attack on what is Australia's largest online gaming community, he was caught out by a nobody using a dialup account in New Mexico.

"We think the first violation would have happened around 1pm that afternoon and we picked it up around 6pm that night," says Williams. "We found him because we got an [automated] abuse email from an ISP to say that

our IP address was port scanning." The hacker used a vulnerability in SSH which had just been posted as a security alert. Literally within a day of the exploit being known its server was hit. The server didn't contain sensitive data, and they couldn't see any damage. "I don't think they really know what to do when they actually gain access. They know if they do too much, someone will notice."

HACKING ON THE INCREASE

Over the past 12 months, Williams has noticed an increase in nuisance scanning, bogus login attempts and virus attacks hitting the 40 servers Ausgamers manages for its 60,000 members. The company has given up logging suspicious login attempts and changed its firewalls to accept approved IP addresses.

Its experience mirrors the results of the 2002 Australian Computer Crime and Security Survey, which shows hacking activity has doubled

since the last survey in 1999. The joint study by AusCERT, Deloitte and the NSW Police found that 67% of organisations reported a hacking incident. The report showed a shift in the forces driving the massive increase in hacking activity, as external hackers overtook internal staff as a bigger threat.

The increase in hacking activity has hooked public imagination on the idea of a "Digital Armageddon" or global communications collapse. Yet international terrorists aren't the reason a typical home dialup user registers more than five malicious scans as soon as they login, or when a broadband user is subjected to a continual stream of port scans. It doesn't explain why businesses are hit with so many malicious probes that they can no longer afford to log them.

The real culprits are more likely to be bored teenagers killing time in the Christmas holidays.

Hacking expert Gilbert Alaverdian investigates attacks on corporate networks

Snapshot: Tech trends at a glance

GLOOM TO DOUBLE GROWTH

Despite the gloom, experts say the global IT market will double its growth rate in 2003 to 5.6%. Both Gartner and the European Information Technology Observatory agreed that spending on IT would be around US\$2.3 trillion (2.36 trillion euros, AUD\$4.25 trillion) in 2003. The big growth areas: enterprise portals, wireless networking and mobile data services.



WHAT PRICE STABILITY?

ATI's wunderkind, the Radeon 9700 chipset, is enjoying its ride atop the video card speed charts, but it hasn't been a smooth ride. Compatibility issues with some motherboards and games have left new adopters scratching their heads, and potential customers holding off.



BMX XXXED OUT

The Office of Film and Literature Classification's latest yuletide tradition seems to be stopping video games hitting shelves. Acclaim's BMX XXX has been bestowed the coveted Refused Classification (RC) rating, meaning that it can't be sold in its existing



form. The game's message? "We're going to hell, and you're coming with us." Immoral and licentious gamers were last seen sending their money offshore to import their slice of damnation.

SUN BURNS 11% OF PAYROLL

Sun Microsystems has announced its intention to axe 4,400 staff, 500 more than last year's staff cull at Mountain View. The move is viewed as tacit acknowledgment by Sun that economic recovery from the IT slump will be a gradual one. Lacklustre corporate IT spending has been named as the culprit for the cuts.



SIGNAL FAILURE

Telstra communications finesse was under question after news of its bungled weatherproofing of cables, now rotting in a suburb near you. Telstra couldn't decide on how much fixing the problem would cost. The telco's estimates to the press (\$75 million) to fix the problem being a lazy \$112 million less than what it told the Government it had set aside for regional Australia alone.



3G A DARK HORSE IN

WIRELESS RACE?

Undervwhelming interest in 3G mobile telephony has several savvy companies considering a move into the broadband space. Plans by a consortium including players ArrayComm, Vodafone and OzEmail continue to look promising, and other telcos are contemplating joining the (broad)bandwagon.



REDMOND RED-FACED

Microsoft CEO Steve Ballmer promised to "castigate the offender" after a swipe at Apple's "Switchers" campaign went horribly awry. The paragons of trustworthy computing profiled a "switcher" of their own, but her glib turn of phrase and appearance in stock photo archives led to the discovery that she was bogus.



AMD IN FREE FALL

Further pressure on AMD's upcoming Hammer line of CPUs has been brought to bear after AMD's sales continued to spark concern for the CPU giant. The company's third quarter results reported a net loss of over US\$254 million.



Data Dump

Quote file

"You know how badly they want to do San Francisco. We don't have to let them."

Charlie Greco, IDG World Expo (organisers of MacWorld)

Apple, unhappy with MacWorld's move from New York to Boston in 2004, put its east coast attendance at the event under review. IDG's CEO upped the ante, raising the possibility of Apple being banned from MacWorld.



Number crunch

Tax returns lodged with ATO	
18/09: 543	01/02: 392,599
Cost of 64MB EDO RAM (1997)	Cost of 512MB RAM (2002)
\$1,075	\$300
Local video games market value (2001)	Federal Govt games industry spending
\$500m +	\$0
Ericsson's third quarter loss	Nokia's third quarter profit
US\$540m	Euro\$881m
ISP customer service complaints to Telecommunications Ombudsman	
99/00: 282	01/02: 1,940
Microsoft's net income	
1985: US\$24m	2002: US\$7,829m

US\$2.73b

Microsoft's first quarter net income. CEO Steve Ballmer said: "It is kind of a one-time anomaly"

Exchange: Steve Ballmer



Microsoft's CEO and hard-nosed head-kicker made a sudden dash to Australia after Telstra — Microsoft's largest local customer — announced a huge open source deal with Sun.

Telstra and Microsoft staged one brief appearance during Steve Ballmer's recent whirlwind visit (Telstra CEO Ziggy Switkowski couldn't make it so instead he sent the head of its Retail division Ted Pretty) and APC joined the media scrum as the big man let fly his views on the growing threats to his software empire.

ON THE OPEN SOURCE THREAT

There's no innovation going on in the desktop environment either in Linux or in StarOffice. Linux is a cloning operating system — it's cloning Unix and now it's trying to clone Windows. But I think some people think it would be nice to get some new innovation. StarOffice is even more a cloning-type system.

You take a look at the functionality of StarOffice and compare it to Microsoft Office. It's quite a bit weaker. Some people like to say: 'but nobody uses most of the capabilities'. In all studies we do, most users in business use 80% of what's in Microsoft Office. People say: 'I don't use 80%'. The truth is that you use models, you use programs, you use presentations that have been created by others.

So the capabilities in StarOffice are weak, it sits on an operating system foundation which is very expensive to maintain and frankly, not very usable would be my assessment.

ON CODE SHARING AND COMPETITION

Windows is the most developed operating system ever. More developers have written more programs on top of Windows than any other operating system ever.

Now with that said, are there some developers who feel like and probably do benefit in some ways by having access to the source code of an operating system or runtime environment? The answer to that is almost certainly, yes.

We have announced and are instituting something we call our Shared Source program, where we are sharing our source code. We're not putting it in the public domain inconsistent with a commercial business model — we do have a commercial business model I will admit — but we are sharing our source code with large ISVs and integrators, government and academic institutions.

ON THE PRICING AND LICENSING BACKLASH

Among our largest customers we've seen pretty good uptake. But that doesn't mean there haven't been issues; that doesn't mean we haven't had to work through some issues. I've been quick to tell people that we've learned a lot from the way we managed this transition. We could have done it better.

I think there's a lot of value that we deliver in Windows and Microsoft Office and that justifies it having a good and positive price. Now, if for whatever set of reasons, our commercial terms are an impediment to using our product, we'll always try to sit down with a [large] customer and work through the commercial terms. I'm at steveb@microsoft.com.

ON DIGITAL RIGHTS MANAGEMENT

I think that DRM is a technology that might make sense to include in Windows some day. We have it in some degree already in the Windows Media Player... maybe to embed in a general application server. I can see that Microsoft Office would be enhanced by taking advantage of DRM some day. I can maybe send you a piece of mail and I say: 'This is gonna self-destruct in 30 days and you can't print it.' So I see a lot of opportunities.

Think about document protection in companies, or notes. Say reporters' notes need to be held for five years, and they're held in some sort of privileged category for reporters' notes. That's a DRM policy that a corporation could write, and you'd want your notes, whether they're taken in Word or whatever, protected in a certain way.

So I think that it's an enhancement technology, and I'm not sure how we'd price it. I think it has enhancements to the basic way information workers work.

ON MAKING MONEY FROM DRM

Well, I don't see us taking a cut of every transaction. But if a content provider is going to offer DRM-protected content, there's gonna be devices, tools and servers to prepare it, and we'd be selling servers and tools.

So, we're not a charity; on the other hand I don't think the model is to take... I don't think that's gonna work to try to say that somebody who creates the security technology gets to take a certain percentage, I don't think that'll

Is it legal ...

To register a domain name and then sell it for a higher price?

The late 90s was a golden age for domain speculators as dot com dreamers stockpiled names in the hope they would appreciate like prize real estate. Cybersquatting became rampant among high-profile celebrity, company and place names (such as www.madonna.com, sydneyoperahouse.net, www.telstra.org and even one typosquatter took bigpons.com).

Recent anti-cybersquatting laws make it relatively easy for trademark holders to rescue their names, and the domain industry has cracked down on rogue dealers.

But what about general words, such as www.outlook.com or www.computer.com.au, that do not have a clear trademark owner? Domain names are licensed on a "first come, first served" basis for a specified period of time. You never actually "own" a domain so it's not yours to sell. However, the regulations governing top-level domains, for example .com and .net aren't as strict as those covering second-level .au domains.

So while you're not supposed to register a .com name for the purpose of selling it, you can transfer it to another party on mutually agreed terms (www.linux.com was reportedly sold for US\$1 million and www.broadband.com was listed for sale on a domain appraisal and auction Web site for US\$975,000).

But you are not allowed to sell your .au domain. You can transfer the name under limited conditions, including as part of a business acquisition, if you go broke, you die or "become insane".

Australia's domain regulator, auDA, can immediately revoke your licence and repossess your name if they discover it's on sale.

be fundamental. There may be intellectual property patents that we would license and be part of.

Right now the whole intellectual property area is a little confused frankly, because you have Intertrust suing us, we have a patent pool, Xerox has a patent pool, Intertrust has a patent pool. Everything's a little confused right now on the patent and IP standpoint with regards to DRM.

ISPs eating spam at source

As the Federal Government prepares to release final recommendations from a year-long investigation into spam, ISPs to are now moving to block the source.

Australia's ISPs have been reluctant to block even well-known spam and self-propagating virus strains (especially if they bill by the megabyte) and authorities are hesitant to outlaw unsolicited email. But with spam now making up 20%-30% of all email, the network burden is becoming unsustainable.

Pacific Internet became one of the first large ISPs to block virus and spam at its mail servers. "[We] can't turn around and say it's nothing to do with us anymore. As an ISP, you're a service provider and you've got to take some sort of responsibility to improve the service for the customer if you can," said Pacific product manager Kylie Hutchison.

She tells the story of one customer who pleaded for help after he was hit with 50 spam emails in a matter of hours. All they could do was give him a new address.

Then in October, Pacific implemented SpamAssassin across their mail servers. The open source program analyses each email

header and body for notorious spam disguises and phrases (such as "enlarge your..." and "this is not spam"). Pacific also installed high-capacity virus, worm and Trojan filters using Symantec AntiVirus Command Line Scanner (with new definitions updated several times a day).

Internode has also trialled SpamAssassin, said marketing officer Kate Harris. "ISPs handle great volumes of email in a 24-hour period. To pass every inbound email through a series of filters places great load on email servers.

Spam is often hard to pinpoint precisely and it is possible that blocking filters can hinder the delivery of normal email." They currently block some spam-prone servers by subscribing to MAPS (Mail Abuse Prevention System).

Hutchison said you can choose to opt in or out of filtering. "Obviously on broadband, people are very aware of included megabytes and making sure they're not downloading something they don't want."

Results from early filtering on 122 selected

Filter test

Does ISP spam and virus filtering really work? APC forwarded more than 50 spam emails (quarantined from a suffocated Hotmail account) and several virus and Trojan files to a new @pacific.net.au email address. Pacific caught around two-thirds of the spam and replaced the viruses with a warning text file. An unidentified .exe and one Trojan file evaded their filters. All legitimate mail was delivered.

staff and customer accounts shows their strategy is lessening the spam and virus crisis for home users. In a single day, 11,561 messages were scanned and 345 (3%) trapped as spam and 1,183 (10%) quarantined as a virus.

"It's tweaked to more likely allow the occasional spam to get through than it is to be really strict and possibly prevent real email from coming through.

"But if people feel that they may have lost mail [or a virus], they can contact us and we can find it for them," added Hutchinson.

Quarantined mail is kept for 14 days.

Geoprofiling software to aid crime fighters

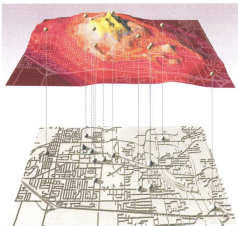
The Washington sniper shootings have brought the field of geoprofiling into the public eye as never before. Akin to data mining, the ability to interpret incoming data on crimes and match it to known criminal behaviours is increasingly in demand. The trouble is, there's always a lot more analysis to be done than people to do it.

Developed by Canada's Environmental Criminology Research Inc. (ECRI), the software Rigel has been around for years, but it is only recently that it has been making an impact. The Java-based profiling software is available on a host of platforms, including Windows ME through to XP. It merges geographical mapping with a powerful, constantly updated database tool. By employing a custom algorithm ECRI called CGT (Criminal Geographic Targeting), Rigel cross-references known serial criminal behaviour against the terrain where crimes are being committed. Investigators are then able to pinpoint likely future zones and even the likely location of the criminal themselves.

While Rigel can narrow down a likely location of the serial criminal, its real use is in narrowing down lists of suspects to a manageable size. In the wake of the sniper

attacks, crime experts have been quick to reinforce the point that tools like Rigel are an adjunct to existing investigative work. In the case of the Washington sniper, geoprofiling was regarded as a last resort due to the lack of evidence about the identity of the killer.

ECRI chief scientist Dr Kim Rossomo is credited with taking a leading role in the development of Rigel. "Geographic profiling is



Zeroing in: when combined with global positioning, Rigel's ability to pinpoint culprits soars.

best thought of as an information management strategy to assist in serial violent crime investigations," Rossomo said. "It doesn't give you an 'X' that marks the spot but it does allow you to focus investigative efforts."

Two key items are necessary to commence Rigel analysis: a street map of the region; and a list of the locations where the suspected serial crimes have been committed. The database-style program then allows trained investigators to enter the location details. When coupled with GPS technology, this latter option helps make educated guesses in even sparsely populated areas.

When entering in a sequence of crimes and crime scenes, the profilers assign a rating of the crime as being part of a sequence. Every possible piece of information — including time and dates of crime — is fed into the equation. Reports can then be generated and suspects assigned a given probability of being the culprit. The results can be visual: either as two or three dimensional topographical maps.

Future advances will be focusing on a more immediate approach, including predicting where and when serial criminals will strike next.

finding its way into IT server rooms. Many businesses started using .NET and other Web service technology on inhouse projects in 2002. Still, Web services built for consumers are yet to take off.

SECURITY

① Palladium details flood the Net

Not content with trying to lead Digital Rights Management (DRM) into the new millennium, Microsoft has much bigger fish to fry. Palladium isn't merely software, and it isn't merely hardware. It's a philosophy that will change the face of computing at a fundamental level. In the absence of firm, coordinated opposition, your hardware and software will play a key part in advertising your presence and location to the powers that be. Less control of your hardware — including the content on your hard drive — is supposedly the price you will pay for a more integrated and secure system. After all, if you can't trust OSes and hardware developers, who can you trust?

② Access vulnerability in wireless networking



The sexiness of wireless networking took a hit in the public and enterprise's eye when a raft of vulnerabilities and flaws were presented with the standard. If an unwary network admin is lazy enough to do a rollout of a wireless network using default installation values, trouble is guaranteed. If it's a reasonably trafficked area, it won't be too long before those wacky folk with the laptops and the antennae start hanging around. Promised tighter encryption seems to be lagging as well, possibly because every time a new standard is announced, it's cracked before a product can make it to market.

③ The bugbear and klez viruses

The lowest common denominator of viruses, these Win32-based exploits don't do anything revolutionary, but they have gotten more virulent and harder to rid your system of. Fundamental exploits hold no cachet in the virus

making community, so you have to chalk the rise and rise of such viruses to the army of "script kiddies" out there downloading hacker tools.

COMPONENTS

① ATI takes the video lead

While nVidia was busy making the cover of *Wired* magazine and courting Microsoft over the Xbox, ATI showed that it wasn't giving up the fight for the performance video dollar. The first inkling for many that ATI might have a contender came during Los Angeles' annual E3 games expo. Software titans id Software demoed the hotly anticipated Doom 3 card, dubbed R300, on pre-production ATI silicon. Since then it's hit the markets as the Radeon 9700 series, and despite teething flaws, it's hands down the fastest consumer video card on the market.

② Intel, AMD confirm DRM support to be integrated into their chipsets

A few years ago, supporting a standard like DRM would have given you an Intel CPU serial number-sized headache. Now thanks to deft marketing, it's as close as your next major upgrade.

③ The LCD monitor's stealth takeover

They looked cool, but there were a lot of strikes against them. Too expensive. Too flimsy. The technology was rushed to market. All the predictions of doom have proven wrong. LCD monitors are hitting enterprise and the government sector in particular in big numbers.

MICROSOFT

Microsoft stood firm and reaped the spoils from controversial changes to its business licensing program announced last year. As anger among customers grew at the complexity or extra costs of the upgrade regime, Microsoft delayed the compliance deadline until August. In a strategic admission to the growing appeal of open source alternatives, Microsoft made an unexpected official appearance at LinuxWorld. By October, it was estimated 40% of enterprise customers had yet to sign on. But Microsoft emerged victorious when the

new scheme helped double profits to over US\$5 billion for the three months to September 30. The results from a proposed settlement of the long-running antitrust battle with the US Department of Justice finally hit the desktop in August. Windows XP Service Pack 1 included a new setting giving users one-click control setting default browser, email and media software.

Microsoft also disclosed hundreds of previously secret Windows APIs and communications protocols to third party developers. And Bill Gates decreed that security would become the number one priority for all divisions in the company. The Gates Trusted Security Initiative came after consumers rejected plans for .NET My Services.

HPQ

The biggest merger in IT history started off disastrously, and it only got worse. HP and Compaq finally merged in May, but it wasn't without some hurdles as the company had to first win a humiliating court battle when HP board members William Hewlett and David Packard opposed the merger. Then Hewlett accused HP CEO Carly Fiorina of coercing Deutsche Bank investors during the merger vote. The accusation, although false, tarnished the merger. For a brief time, HPQ was number one in desktops. However, while the new company dealt with the horrors of competing company cultures, staff gripped at mass sackings and the integration of duplicated product lines, chief competitor Dell soared ahead in sales.

NAPSTER

The online music sharing site finally died for the umpteenth time. In September, a US federal judge blocked the \$9 million sale to German media giant Bertelsmann. The remaining 42 staff were laid off and liquidators appointed. At the time of writing, a judge had granted a \$200,000 loan to the company to keep afloat while assets are sold. Napster founder Shawn Fanning sold his life story to MTV. **ETES**

JANUARY ▶	FEBRUARY ▶	MAY ▶	JUNE ▶	JULY ▶
▶ Apple launches new iMac	▶ Fed Government to investigate spam	▶ Linux vendors combine to form UnitedLinux	▶ Mozilla 1.0 released	▶ Microsoft reveals plans for wireless products
▶ Gates unveils "Trustworthy Computing" initiative		▶ HP and Compaq create biggest merger in IT history		▶ OptusNet Cable raises prices, caps downloads
AUGUST ▶	SEPTEMBER ▶	OCTOBER ▶	NOV ▶	
▶ 28,000 BigPond customers reimbursed for outage	▶ Sun announces Linux desktop PC for business	▶ RealNetworks announces plans to release source code	▶ Pentium reaches 3GHz	
▶ Microsoft's new business licensing scheme comes into effect	▶ Broadband subscribers doubled to 200,000, says Telstra	▶ Steve Ballmer visits Australia, Microsoft records US\$2.73 billion first quarter profit		

need to know

News, views and analysis from the IT world

The year that was

With the year winding up, APC recalls a number of significant events and technologies that shaped the IT industry in 2002.

SPAM

Spamming didn't fade away like we'd hoped; no, instead we had the onset of "spam wars", with anti-spammers resorting to black lists in a desperate attempt to ban traffic from the Net addresses of known spammers.

But the plan only led to more headaches, with ISPs inadvertently blocking traffic from servers of major ISPs like OzEmail. Local direct marketer T3 sued after finding itself on the wrong end of a spam black list. T3 lost the case, but email users weren't taking too much comfort, considering the lack of sure fire legal remedies.

In the US, anti-spam laws were tested for the first time, with someone being fined nearly US\$100,000 for sending emails selling a booklet: "How to Profit from the Internet".

As 2002 ends the Australian Federal Government prepares to release final recommendations from a year-long investigation into spam.

BROADBAND

The year began with widespread outages across Telstra's ADSL network. Then in February, Telstra changed its plans so users had to either pay more or download less. Attempts to pacify customers by pledging partial refunds for network downtime backfired in August when one widespread outage forced Telstra to fork out more than \$170,000 to 28,000 people.

The broadband market hit rock-bottom in July when OptusNet Cable — widely regarded as the best value high-speed ISP in Australia — also raised prices and capped downloads.

Hopes were raised mid-year as a new generation of broadband providers began offering services over Telstra's ADSL network (following changes to wholesale pricing). However, the new plans turned out to be very similar to Telstra's. By September, Telstra said they had doubled broadband subscribers to

200,000 since the beginning of the year and remain on track to reach one million by 2005.

OPEN SOURCE

The prospect of a mega-Linux cartel emerged in late May when four major Linux distributions (SuSE, Caldera, Conectiva and TurboLinux) banded together to create UnitedLinux. With commercial success firmly in their sights, each player agreed to cooperate on development and standards while preserving individual distros. The first full version of UnitedLinux was slated for release in November, close to the release of version 8 of rival (and still number one) Linux distro, Red Hat.

Two major open source applications made it to mainstream public release after years in development. The May release of OpenOffice was followed in June with Mozilla 1.0. Home users could finally set up an open source desktop with a set of features comparable to a standard Windows PC. Then in September, Sun announced it will offer a Linux desktop PC to businesses, bringing open source software one step closer to becoming a Windows-killer.

WIRELESS

Wi-Fi standard 802.11 introduced PC owners to the possibility of accidentally stumbling across free high-speed Internet access while sitting in a hotel room, or at a bus stop, in a city skyscraper, or if you're really lucky, just sitting at home. When the year started, wireless was something found in cafes or airport lounges and gave schoolkids an opportunity to make homemade radio-wave antennae from Milo tins. By year's end, Intel was investing US\$150 million in wireless startups and Microsoft was planning a line of its own Wi-Fi gear.

Curiously, the initial hysteria over wireless happened almost without the usual shouting from vendors. Community groups wanted it for free broadband; ISPs found it a cheaper alternative to

DSL; eyes even lit up in the Federal Government, which decided to waive expensive carrier fees for Wi-Fi operators. Still it hasn't all been smooth sailing. Paranoia about wireless hacking dented enthusiasm for wireless amongst businesses, as did news reports of carloads of antenna wielding pranksters, cruising the streets scanning for unprotected nodes.

Meanwhile, wireless data speeds have been steadily increasing, from 11MB/s under 802.11b, then to 22MB/s and now to 54MB/s with 802.11a. There's still 802.11g which will help compatibility between wireless networks, as well as even higher speed technologies such as ultrawideband.

WEB SERVICES

Despite lots of assurance that Web services would change the world, the concept had most people

scratching their heads as they entered 2002. Microsoft copped most of the flak, especially with an ambitious plan for a central Web repository for consumer credit card details, addresses and other personal data. Privacy concerns left Microsoft executives with egg on their faces and the plan has been in flux ever since.

Despite these setbacks, the basic concept behind Web services — a system of protocols to allow disparate systems to seamlessly communicate online — is



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DRM is supposed to protect copyright. For Microsoft, it's more about seeding Windows media codecs.

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More APC readers' letters on topics such as PC advisers' benchmarks and plenty more.



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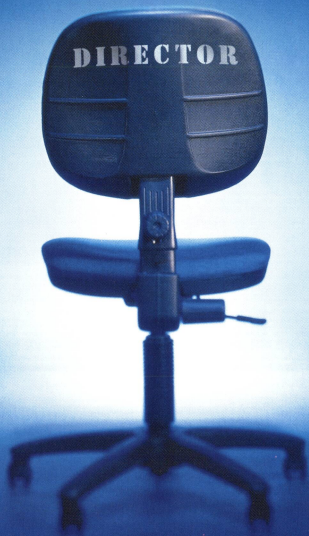
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ISSUE 288 DECEMBER 2002



I've been staggered by the response to last month's bonus CD that featured Mandrake Linux 9.0, and our accompanying feature on how to get this cool new distro up and running. I've also been staggered by the type of response — by the type of readers who have emailed, phoned or written to thank us, and to share with us why they find Mandrake so compelling.

They aren't the typical IT professionals and power users who make up the largest part of APC's readership. A surprisingly large portion of those readers are, well, regular folk. They're the sort of people who use Windows on a daily basis. Not altogether happily, of course, which is why they're trying an alternative. And those are the two key words.

They're trying Linux — something that you could never have done before distros reached a degree of mainstream maturity, before simple setup routines, slick user-friendly interfaces and stronger device support. Never before has Linux been so inviting, so accessible, so comfortable.

And they're trying Linux as an *alternative*. Maybe it'll replace Windows on their desktop; maybe it won't. Perhaps it's a way to cut software costs in their business. Maybe they'll be content to install Linux on a second, older PC at home, just to learn a little more about the OS or simply take back a bit of control.

But whatever their specific reasons, we're now seeing a new wave of Linux users. It's not just Mandrake that's driving this. It's also distros like Lycoris/Desktop LX, which apes Windows XP to such an extent that you'd expect lawyers to be circling.

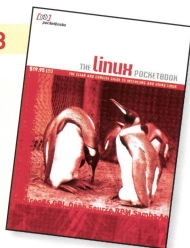
Sure, Linux is far from perfect. But despite its many strengths, neither is Windows XP. And Linux certainly isn't the OS for everyone; but neither is Windows. And that's what these latest distros are finally proving.

David Flynn

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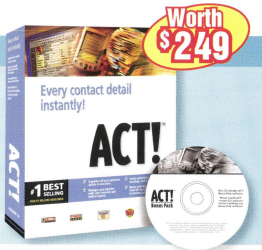
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- **IIS** Expert strategies to make IIS work harder and faster.
- **Linux** We get hands-on with Red Hat 8.0 and try to figure just what fuss is all about.
- **Handhelds** Inside the new Palm OS 5 operating system
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On Test



- **Reviews** We set the Pentium 4 3GHz against the Athlon 2800XP+, check out Palm's new handheld, review two external hard drives plus new disk utilities, and more (see right).
- **Toshiba's Pocket PC e330** Plus, new audio cards from Creative and Hercules and more new gear in First Byte.
- **Hyperthreading** It's landed on the desktop so Tech Briefing explains what the technology means to you.
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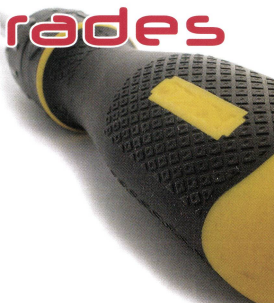
APC's pick of the best products from the year — and a few of the biggest disappointments, too.



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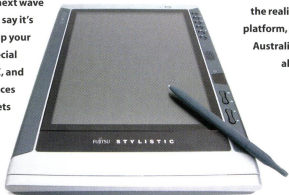
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Tablet PCs

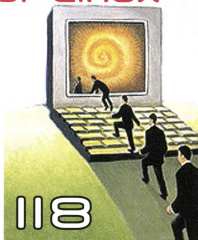
Microsoft says it's the next wave of notebooks. Vendors say it's a niche market. Make up your own mind with this special report on the Tablet PC, and our hands-on experiences with the first four Tablets from Acer, Fujitsu, HP and Toshiba.



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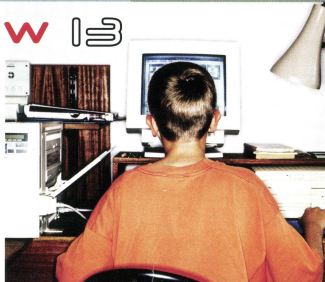
APC recalls many of the significant events and technologies that shaped the IT industry in 2002.

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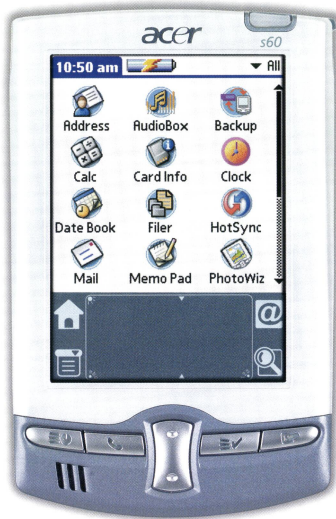
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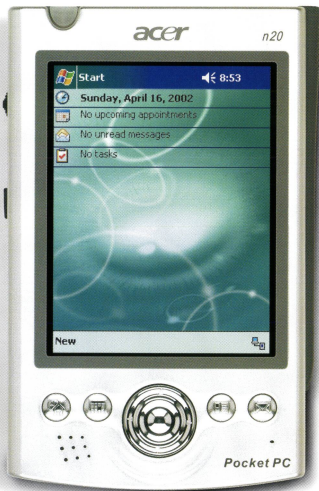
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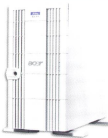


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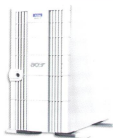


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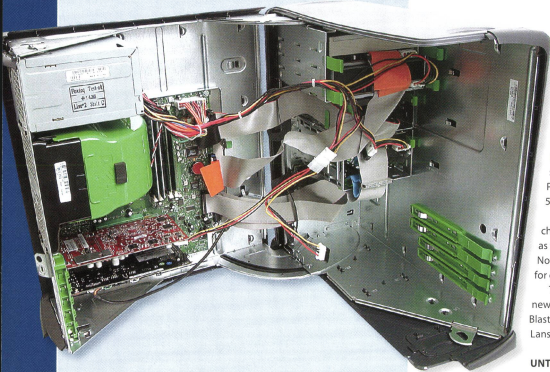
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Open up a new Dimension

Dell is first out of the gate with a Pentium 4 3GHz desktop.

So does the new Hyperthreading chip make a difference?

There are a handful of vendors who are always quick off the mark when it comes to shipping machines with Intel's fresh-baked chips, and Dell is one of them. As soon as Intel's latest CPU goes from being "unannounced product" (a classification which means the company refuses to talk about it) to a loud-trumpeted technology breakthrough, it tends to find its way inside a Dell PC.

AMD Athlon XP 2800+

It was one of those 'Stop the presses!' moments. Just as we were going to print, APC received an AMD test platform built around the sizzling Athlon XP 2800+. Although AMD's processors lag behind Intel in clock frequency, the underdog chipmaker is often considered to be a step ahead in price, performance and features.

The testbench saw the Athlon XP 2800+ CPU married to an Asus A7N8X motherboard with 512MB of PC3200 DDR SDRAM and a Radeon 9700 Pro AGP card. This config racked up 11,783 3DMarks, a tally in keeping with the processor's nominal rating as a 2.8GHz CPU.

When you consider that the Dell Dimension 8200 and its P4 2.8GHz CPU scored 11,448 3DMarks, yet requires the more expensive RDRAM instead of the Athlon's DDR SDRAM, the AMD platform still appears to have the edge.

The 3.06GHz Pentium 4 is no different. APC got its hands on the very first production PC fitted with this silicon speedster, and it turned out to be the Dell Dimension 8250. Naturally, this is the pride of the Dell family, so it's fully optioned with a Radeon 9700 Pro AGP card, P991 19in Trinitron display and 512MB of RDRAM.

The Dimension 8250 uses the same charcoal coloured, tool-less entry chassis as the Dimension 8200 (reviewed in APC November, page 112) which swings wide open for easy access to the PC's innards.

The interior is identical, too, but for the new CPU and the just-released Creative Sound Blaster Audigy 2 soundcard driving the Altec Lansing AFA995 THX-compliant speakers.

UNTAPPED POTENTIAL

We ran the Dimension 8250 through our standard battery of benchmarks, and compared the scores against the 8200 model, which was fitted with a 2.8GHz processor and a GeForce 4 Ti4600 AGP graphics card. At first glance the results would be disheartening, not just to Dell and Intel but to anyone who rushed out to have the first 3GHz desktop on their block.

For example, under Winstone 2001 the Dimension 8200 fared far better than the higher-specced 8250. The 3DMark 2001 Pro benchmark on the other hand, showed a marked improvement in favour of the 3GHz machine, clocking in at 14,761 3DMarks against 11,448 from the 2.8GHz Dimension 8200.

The reason for this disparity? Conventional 2D benchmarks like Winstone and SYSmark show little difference between a 3.06GHz, 2.8GHz or a well-heeled 2.53GHz machine, and even the presence of Hyperthreading in the new chip has no effect. That's because of the relationship Hyperthreading has to conventional benchmarking techniques: there are no test suites currently available that can accurately gauge Hyperthreading's performance boost (for more on this, read this month's Tech Briefing on page 56).

It will take the release next year of new Hyperthreading-aware software — both in the application and benchmarking space — to harness not only the processor's native speed increase but the capabilities of Hyperthreading.

David Lin

Details >>

Processor Intel P4 3.06GHz
Memory 512MB RDRAM
Hard drive 80GB Maxtor
DVD-ROM Samsung SD-616T
Networking NEC NR-910DA integrated 10/100Mbps
Modem 56K
Audio Sound Blaster Audigy II sound card
Graphics 128MB ATI Radeon 9700 Pro AGP card
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► **Mini-Lab:** alter one image or all the images in a folder depending on the task.

business cards or CD covers via ready-made templates.

The most common tools, such as rotate, crop and re-size, are easy to access, with other categories such as touch-up and special effects presented in the familiar Windows manner. Simply click or hover over a section and the options available to you are quickly revealed. With more than 150 effects to choose from, the creative juices shouldn't take long to get flowing.

Both Elements 2.0 and Digital Image Pro 7.0 sport very effective file browsers, although Digital Image Pro 7.0 also has the useful ability to resize the thumbnails in the preview window.

The Mini-Lab is a truly useful area, with the ability to apply individual or collective adjustments depending on the task you want to perform. For example, you can perform a global adjustment on all the images in a folder at once with the auto levels tool, or make fine adjustments on each image using the tint tool. This level of automation, combined with individual image control, will please most digital imaging enthusiasts.

IMPORTING PHOTOSHOP FILES

The ability to import Photoshop files is a powerful feature, although Photoshop attributes such as layers and clipping paths are lost in the process. Digital Image Pro provides layer-like controls over images created in the program, allowing text and images to be layered one on top of another, with separate access to each element. This implementation of layers provides a simple "clip stack" viewing area on the right of the screen, with an orange dot highlighting which part of the document is available for selection.

On the other hand, the much-touted support for Photoshop plug-ins is patchy. Only filters with an .8bf file extension are accepted, and that doesn't seem to include many of the plug-ins that shipped with Photoshop 7.0 or Elements 2.0.

Benchmark comparisons between Photoshop Elements 2.0 and Microsoft Picture It! Digital Image Pro 7.0 are difficult due to the differences in completing most tasks. For example, Digital Image Pro does not have a Gaussian Blur function, although its Blur tool works in a similar manner. The effects also differed slightly, although the outcome was often identical.

A 100MB Photoshop file took considerably longer to load in Digital Image Pro compared to Photoshop Elements, but once the image was loaded, both programs handled manipulation at similar speeds.

The more experience you have with Photoshop, the more likely you'll stick with Photoshop Elements for undemanding digital photography work.

But for the masses who have rarely, or never, used Photoshop, but now count a good digital camera among their kit, Digital Image Pro 7.0 is going to be hard to beat.

Denis Gallagher

Picture perfect

Microsoft's solid mid-range image editing program appears set to muscle in on Adobe Photoshop Elements' potential marketshare of digital camera users.

Microsoft's "home" applications are growing up. First it was Publisher, a program that began life as a "desktop publishing for dummies" program which later morphed into a highly confident DTP package. Publisher has left its mark too, the earlier version heralded the introduction of wizards — a hallmark of all Microsoft apps and the Windows OS itself.

Now, the digital photography boom has seen Picture It! mature with the release of Digital Image Pro 7.0. But don't let the version number fool you — this is the debut for Microsoft's new mid-range photo editor, and it has Photoshop Elements (APC November, page 42) firmly in its sights.

Digital Image Pro strikes a brilliant balance between Picture It!'s traditional point-and-click appeal versus professional-level features and plenty of manual controls. And unlike Elements' interface and way of working — which clearly shows Adobe's Macintosh roots — Digital Image Pro is consistent with other Windows programs (and naturally enough, it leans heavily towards Microsoft's Office applications).

FEATURES

Digital Image Pro's main screen presents options to open, scan or import an image from a digital camera. If you want to jump straight into click & create format, the "create a project" button is perfect for making calendars,

Details >>

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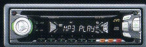
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DEC 2002



Satellite star

Keen price, sharp performance and sensible design come together to put the Satellite 2410 into orbit.

A few flaws aside, Toshiba's latest Satellite 2410 is an impressive notebook, especially given the appealing \$3,100 price tag.

The battery life is excellent. After disabling all power-saving utilities and settings, the BatteryMark test did well with a figure of 2.5 hours. With SpeedStep enabled and Windows XP's power settings in notebook configuration, this stretched to just under three hours. The battery recharge time was less inspiring, with a full recharge taking close to four hours.

You could almost retire your desktop, as the Satellite 2410 packs quite a punch in the performance stakes. The Mobile Intel Pentium 4 1.7GHz processor, coupled with 256MB of PC2100 DDR RAM, helped push the Satellite 2410 to a Business WinStone score of 40.1. While not the fastest notebook score we've seen, there's more than enough grunt to multitask with even the most resource-hungry applications. Also, there was very little operational noise from either the Toshiba 30GB hard drive or the Teac 16x DVD drive.

GRAPHIC AIDS

Graphically, you'd be hard pressed finding a better notebook. The integrated nVidia GeForce 4 420Go video adaptor scored a respectable 3,912 on the 3DMark 2001 benchmark. This is a very good result for a notebook, almost enough to make you forget that the Satellite 2410 was limited to only 16MB

of video memory. The 3DMark 2001 benchmark balked twice with "out of video memory" errors, but this problem was fixed when we installed the latest nVidia Detonator drivers. Gaming should pose no problem, as long as you don't go silly with the render settings.

The 14.1in Active Matrix TFT screen displayed all colours, text and images true, and is capable of a resolution up to 1,600 x 1,200. The TFT screen panel uses "floating display" technology, which in simple terms means the screen isn't hard fixed in place within the screen housing. It feels more like it's spring-loaded, and isn't as delicate as most notebook screens.

Pressing on the screen flexes it, so if the notebook is dropped or mishandled, the screen shouldn't suffer any damage — some clever thinking by the engineers as the screen is usually the most expensive of notebook repairs.

However, this does mean that the housing is a little thicker than normal, and when you pick up the notebook in one hand, the actual screen casing flexes. We'll be watching with interest to see how the plastic withstands this flexing over time.

THE RIGHT CONNECTIONS

The 2410 also has more connections than an international airport, starting with three USB 1.1 ports on the rear panel, although these were a little too close together and meant some jiggling around of connectors to insert a USB memory key alongside other devices.

There's also a FireWire port, SD (Secure Digital) card slot, the mandatory pair of PC Card Type II slots, plus integrated 56K modem and Intel 10/100 Ethernet controller. Bluetooth and Wi-Fi missed the cut but at this price we're not surprised, and they remain available as options.

While the keyboard is usually a strong point of Toshiba notebooks, the movement in this model felt a little stiff; however, as with many issues relating to keyboards, this often is a matter of personal preference. The touchpad had good feedback, and the included scroll wheel is a sensible touch.

The keyboard surrounds bristle with buttons, from audio and DVD playback to dedicated Internet and application buttons.

Located below the screen on each side of the notebook are the stereo speakers, and for their size they produce high quality sound from the Yamaha YMF733 sound controller.

The Toshiba Satellite 2410 is undoubtedly a quality notebook which excels in almost all departments. The raw specifications might be slightly off the pace when you price-compare against some other models, but as a complete package it's a serious contender for your notebook dollar.

Ashley McKinnon

Details >>

Processor Pentium 4-M 1.7GHz
Memory 256MB PC2100 DDR
Hard Drive Toshiba 30GB
Display 14.1in TFT
Video nVidia GeForce 4 420Go
Operating System Windows XP Professional
Dimensions (HWD) 46 x 328 x 287mm
Weight 3.4kg
Ports 3 x USB 1.1, 1 x FireWire, 1 x TV Out
Network Intel 10/100 Ethernet
Modem Toshiba Soft Modem
Battery Lithium Ion
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3DMark 2001 3,912
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Verdict ●●●●●

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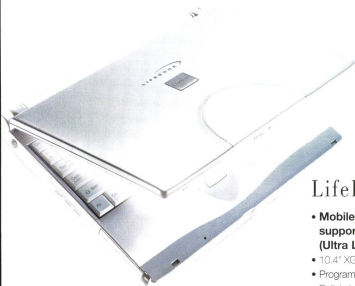
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Bravo, bravo

Primera's desktop duplicator is a clever and relatively low-cost way to burn and label CDs en-masse.

If you regularly distribute a lot of content on CD, you'll appreciate the Bravo Disc Publisher—especially compared to professional-level systems that cost twice the price. The Bravo combines a CD burner and inkjet printer, with a robotic arm to transport the disc through each stage.

The casing sandwiches a 5.25in Sanyo 40x/12x/40x CD-RW drive between two bins which store 25 CDs each—blanks sit in one bin, and finished discs in the other. The print cartridge is located directly above the CD-RW drive. Designed specifically for CD-R media, it borrows its engine from Primera's Signature Pro CD printer and is rated at 2,400 x 1,200dpi.

For all that, the Bravo is about as wide as an average inkjet printer and just a little deeper, making it desktop-friendly.

SETTING UP

The first caveat is that the Bravo requires your PC to have both USB and FireWire ports. The USB connection is used to control mechanics such as the printer and robotic arm, while FireWire carries the raw data to the CD-RW drive.

Installation of the Bravo leaves room for improvement. You'll have to pay attention to the manual every step of the way. And there's no integration between the CD duplication software (Prassi PrimoDVD 2.0) and labelling software (SureThing CD Labeller 3.1). For example, while the first step in Bravo's duplication process is to design a CD label, you're not automatically

taken to the next step of burning and printing the disc. Instead, you have to launch PrimoDVD and manually browse for the label file.

Once Bravo gets going, however, it's pretty much set and forget. The robotic arm retrieves a blank from the input bin and plunks it onto the open CD-RW tray. Once finished recording, the burner ejects the disc and the arm transports it to the printing tray.

A single disc takes about seven-and-a-half minutes to go from blank to printed and recorded; duplicating multiple discs is more efficient as Bravo burns one disc while labelling another.

PRINTING DISCS

Designing the print image for your CD is a relatively easy wizard-driven affair with plenty of background images and templates to choose from. You can also import text, photos and clipart with little fuss, or design the whole CD surface as a single file in an application, such as Photoshop, and then import the file.

The printer runs at four resolution settings, ranging from a fast 600dpi to 2,400dpi, and is more than capable of photo-realistic reproduction. In the end, the quality of the print is highly dependent on the type of media you use. Primera has a list of authorised media partners that produce printable CD-Rs and the costs are comparable to any regular CD recordable media.

Colour and black ink cartridges cost \$95 each. Our batch of 50 CDs barely drained the colour tank by 15%, and the black ink level didn't move at all, although we didn't use a very complex image.

WHERE IT'S AT

Although Bravo is likely to wind up in large companies to run off dozens of copies of artwork, product and price databases and other one-to-many projects, the sub-\$5,000 price tag is going to bring quality automated CD duplication within reach of many small businesses, and perhaps even some rabid enthusiasts.

The closest solution offered by Bravo distributor Verbatim costs at least twice as much and consists of separate components for the robotic arm, printing and burning.

That doesn't make Bravo perfect. As we've noted, the software needs to be overhauled or replaced so that the entire process is tightly integrated, perhaps using a wizard interface to map each step.

Of the 50 discs we produced during testing, the Bravo mysteriously stalled twice, and was unable to continue until we pressed the carriage button on top of the machine. For that reason we'd like to see the front cover made of a transparent plastic instead of a smoked translucent material, so you can see instantly if anything's gone wrong.

Those points noted, the Bravo's appeal as an alternative to duplicating machines such as CD-R towers is undeniable. If your data needs to outstretch a single CD, the Bravo is also available with a DVD burner (featuring Pioneer's DVR-A04 drive) for \$5,500.

A firmware upgrade due in early 2003 will allow blanks to be fed from both bins, doubling the capacity to 50 CDs per session—also due are adaptor kits for mini-CDs and business card CDs.

Simon Tsang

Details >>

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Verdict ●●●●○

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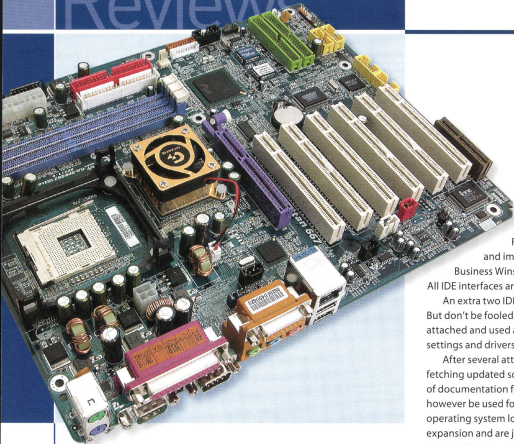
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Connections a go-go

RAID-ready and with inputs galore, this Gigabyte mobo has plenty going for it.

Sporting Intel's new 845PE chipset, Gigabyte's 8PE667 Ultra is packed with features and promises compatibility with future Pentium 4 HT (Hyperthreading) processors. The 845PE chipset can accommodate processor speeds past 3.06GHz; we tested it using a Pentium 4 2.53GHz processor and married to 512MB of PC2100 DDR RAM (although up to PC2700 DDR RAM can be used). The benchmark results brought smiles to our faces.

Business Winstone 2001 returned a score of 64, and with a 128MB ATI Radeon 9700 Pro video card installed we clocked a scorching 11,365 on 3DMark 2001. If the AGP slot was 8x instead of 4x the 3DMark score would have been even higher.

SWINGS AND ROUNDABOUTS

It's a shame that this motherboard accepts fast processors but at the same time can't take advantage of the latest video card technology. The AGP slot does win back some ground utilising a technology called Anti-burn. This prevents damage if a non-supported AGP video card (such as some AGP 2x video cards) is inserted into the slot — which means you shouldn't accidentally toast your motherboard with one simple mistake.

For those seeking even more speed, the Gigabyte 8PE667 Ultra can

handle RAID level 0 (striping) and RAID level 1 (mirroring). We put this to the test using a pair of Maxtor Viper 80GB hard drives and Windows XP Professional. We set up the system for RAID level 0 and immediately noticed an improvement in access times.

Business Winstone was run again and increased to a score of 69. All IDE interfaces are rated at ATA133 speeds.

An extra two IDE connectors are also included on the motherboard. But don't be fooled into thinking that IDE devices can be simply attached and used at will. You need to set up a combination of BIOS settings and drivers under the OS for any devices to be seen and used.

After several attempts to try to recognise an Iomega Zip drive, fetching updated software from Gigabyte and a thorough scrutiny of documentation fixed the problem. IDE channels 3 and 4 can't however be used for boot devices, as they are not seen until the operating system loads. A total of six PCI 2.2 slots allow for add-on card expansion and are joined by a CNR (Communications and Network Riser card) slot.

USB IS PLENTIFUL

Connectivity to external devices is assured with just about every connection type covered. No less than 10 USB 2.0 ports are available (six onboard and four through a slot connector), as well as ports for Memory Stick, Secure Digital (SD) memory card and Smart Card, although you'll need to hook up an optional external reader for these to work. Network support is courtesy of an onboard Intel Pro/100 Ethernet LAN adaptor.

Audio is handled by the Realtek AC'97 onboard audio codec. Although capable of six channels of audio, we found sound output only adequate and not quite in the same league as a dedicated card. There's also an S/P-DIF connector for supposedly "truly realistic audio".

Anyone worried about BIOS corruption or failure will find the Dual BIOS technology of the 8PE667 motherboard a certain comfort. There are two Phoenix D686 BIOS chips, and in the event that one fails the other kicks in.

There's no denying that the Gigabyte 8PE667 Ultra comes well equipped, but ultimately the lack of an 8x AGP slot limits its capabilities. And if you're looking at going for a 3GHz processor, we're sure an 8x video card would also be on your shopping list.

The RAID capability — coupled with up to four IDE connectors — will appease power users, plus the Dual BIOS technology offers piece of mind to the security conscious.

Ashley McKinnon

Details >>

Processor	Intel Socket 478
	Pentium 4 1.4GHz 3.06GHz +
Chipset	Intel 845PE
Memory	3 x 184 pin DDR SDRAM
FSB	533/400
IDE connector	ATA 133/100
Card Slots	6 x PCI 2.2, 1 x CNR, 1 x AGP 4x
Contact	Hallmark Computers
Phone	(02) 9748 8811
Online	www.giga-byte.com
Price	\$330
Verdict	●●●●○

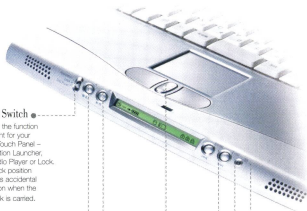
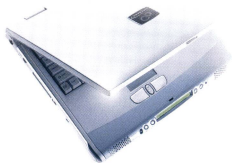
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Selects the function you want for your Quick Touch Panel—Application Launcher, CD Audio Player or Lock. The Lock position prevents accidental activation when the LifeBook is carried.

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www.microsoft.com/piracy/howtotell

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FUT0345_APC





Pocket rocket

An OS upgrade, a new and fast processor, a better display and built-in Bluetooth — this is one hot handheld.

Palm has a problem. Windows-based PocketPCs keep gaining market ground, and Sony's Palm-based offerings keep striding ahead of Palm itself in features and style. Palm has a solution: the Tungsten T. Some two years in the works, the Tungsten (aka Palm m550) marks the joint debut of the Palm OS 5 operating system and ARM-based processors (explored in detail in our Palm Workshop on page 150). And it's built for serious business.

The first thing you'll notice is the sliding panel beneath the display. This covers the Graffiti input area and gives Tungsten an even more pocket-sized form while letting you run apps in "data lookup" mode with the assistance of the easy-to-use Navigator, a four-way rocker with a push-button.

While initially wary of the slide's longevity, it looks and feels solid enough to withstand plenty of action. It's marginally thicker and heavier than the m515, Palm's previous flagship; and it's about 1cm shorter with the slide closed, and 1cm longer when opened.

The brightness and clarity of Tungsten's 320 x 320 pixel panel can only be fully appreciated alongside a 160 x 160 model such as the m515. The difference isn't limited to obvious tests like digital images showcased in the bundled PhotoBase software. The display itself is crisp and vivid, with a paper-white background that's easier to read in any light condition, even on plain text applications such as the DateBook.

The screen's only shortcoming is that Tungsten ditches the m515's choice of three backlight presets (off, low and high) for an onscreen slide control.

HOT TO TROT

Palm has promised that OS 5 will offer extreme compatibility for running older OS 4.x apps, and touted the performance gains of ARM chips against DragonBall processors.

We loaded a number of apps from a Palm m515 onto Tungsten, and most ran without a hitch. However, our favourite hacks either performed erratically or not at all; most totally hung the system.

In the performance stakes, the Speedy 2.2 benchmark saw Tungsten's 144MHz OMAP chip (from Texas Instruments) almost fly off the chart, scoring 1,364 against a meagre 157 for the m515 and its 33MHz DragonBall VZ processor.

More importantly, this extra horsepower translates into real world gains. Slow on an m515 becomes fast on Tungsten, and fast on an m515 becomes almost instant.

Changes to the standard applets are minimal. The ridiculous 4KB limit on memo entries remains, and there's still no form of file management — moving data to an SD card is a two-step operation (copy the data to the card, then delete the original file from RAM).

Only 14MB of the 16MB of RAM is available, the remainder being roped off by the OS as a "heap space" in which programs can write temporary or scratch files. It's a small price to pay for what undoubtedly helps make for a faster OS. Users will be able to reclaim more than their share of memory by using flash tools like Brayder's JackFlash and JackSprat to carve up the 8MB system ROM, which contains language modules for Brazilian, French, Italian, German and Spanish. Still, we're disappointed that Tungsten didn't ship with 32MB of RAM; this was likely done only to keep the launch price down, and we give good odds on the arrival of a 32MB model next year.

BLUETOOTH BUZZ

The built-in Bluetooth works a treat, with a wizard-like setup effortlessly connecting to a Nokia 6210 for everything from simple dialling from the address book to sending and receiving SMS messages and accessing the Net through an ISP. Online applications include VersaMail, a much-improved version of the old MultiMail POP3 email client; and Web Browser Pro, which supports JavaScript, cookies, graphics resizing and SSL, although browsing via anything but a GPRS phone requires Zen-like patience. We had to manually create a setting for a Bluetooth HotSync session to a Bluetooth-equipped notebook, but this was easy and subsequent sync sessions were fast and fuss-free.

Tungsten's few and admittedly niggly shortcomings are more noticeable. The new glass display panel has a sense of friction and drag that almost feels like you're scratching the surface, while the supplied cradle is from the m500 series, and as Tungsten has a different shape it doesn't sit as firmly in the cradle.

At least Palm has stuck with the universal connector, so Tungsten is compatible with accessories from the m100 and m500 series such as keyboards and HotSync adaptors.

And battery life, usually a Palm forte, is reduced to a few days of intensive use between recharges, especially if you're a heavy user of Bluetooth and SD cards.

David Flynn

Details >>>

Contact Palm Sales

Phone 1800 350 535

Online www.palm.com.au

Price \$1,099

Verdict ●●●●○

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Magic moments

While easier to use, a lack of new features means Partition Magic 8 isn't an essential buy.

Partition Magic is one of those rare programs where its name describes exactly what it does, and it undertakes that task so well that it has become the master tool of its trade. What Photoshop is to graphics, Partition Magic is to slicing and dicing your hard drive.

With this latest release, PowerQuest has pulled out all stops to make partitioning even easier and user-friendly than ever before. But if you're looking for breakthrough features, you won't find them in Partition Magic 8.

Novice users will feel at home with the Windows XP-like interface, while improved wizards jump in at every chance.

A new Install Another OS wizard leads you through the adding of an extra operating system. We installed Windows Me to complement our standard Windows XP setup. With little free space remaining for a new partition, Partition Magic 8 offered to resize the main 60GB partition and rope off

a 2GB chunk for Windows Me (which was formatted with the FAT32 file system, against XP's NTFS). But the process wasn't speedy, taking over 15 minutes to complete.

For the security conscious, a Create Backup Partition wizard guides users through creating a partition containing a duplicate of your primary partition, to ensure against file corruption or data loss.

Partition Magic 8 adds support for external USB 2.0 and FireWire drives, although these can't be selected as a bootable device. The NTFS Cluster Resize utility is a questionable inclusion, as most large IT vendors offer cluster utilities which are more suitable to their own products.

Partition Magic 8 remains one of the simplest ways to create, delete, resize, split and merge partitions.

But the lack of new features means that if you've already got Partition Magic 7, you can probably save your upgrade dollars.

Ashley McKinnon

Details >>

Contact: PowerQuest Australia
Phone: (02) 9521 6466
Online: www.powerquest.com.au
Price: \$149 (upgrade \$119)
Verdict: ●●●○

Norton Ghost 2003

Ghost in the machine

Ghost's inability to fully perform all tasks within Windows makes it hard to recommend.

Is the latest version of Norton Ghost the "fully Windows" disk imaging utility Symantec has been promising, without a sign of the familiar old Ghost for DOS screen? Yes and no.

Technically, Ghost 2003 lets you do everything from Windows. The interface provides point-and-click access to all Ghost tools, and clicking the backup button launches a wizard which lets you select the partition or drive to backup, and shows you where to store the image file (external USB 2.0 and FireWire drives are now supported).

But while all the preparation is done in Windows, the grunt work is still carried out in DOS. When the system reboots in order to launch the imaging process, you find yourself back in Ghost's DOS screen. The same holds true for restoring an image.

The DOS interface is clean and simple to use, as it mimics Windows and can be easily navigated with a mouse. You can still drive Ghost's functions through DOS, if you prefer.

To test Ghost 2003 we created an image of a partition containing 14GB of data. Creating the image took just over 11 minutes. Using Ghost's proprietary compression format shrunk the image file to 9.2GB but took almost twice the time. Restoration times were similar to image creation times.

Compression also proved to be a hit-and-miss affair — Ghost's own integrity check utility indicated that of the five images we created, two were corrupt. That's a good reason to always run an integrity check on your images.

What is new, however, is a nice set of Flash tutorials that show the user through all of the tasks that Norton Ghost 2003 can perform. These are good viewing and offer so much more than just reading the manual.

To its credit, Symantec has brought Ghost 2003 as close as possible to being a full Windows utility.

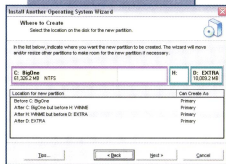
It does its job very well, but apart from the prettier interface, Ghost 2003 is almost identical to previous versions.

Ashley McKinnon

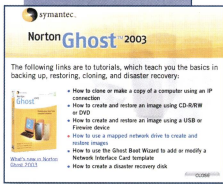
Details >>

Contact: Symantec
Phone: (02) 8879 1000
Online: www.symantec.com
Price: \$139 (upgrade \$99.95)
Verdict: ●●●○

► **Like magic:** this new wizard makes it easy to set up multiple operating systems on a single machine.



► **Interactive tutorials:** learning to use Ghost is made easier thanks to the Flash tutorials.



Satisfying Your Need For Speed

The P4PE socket 478 motherboard, the world's first solution able to support the next-generation P4 CPU up to 3GHz and beyond and Intel's latest Hyper-Threading technology. With the Intel 845PE chipset to deliver DDR333 memory and P4 CPUs on 533MHz FSB, the P4PE is a high-speed solution for the most demanding tasks. Combined with unique features such as C.P.R. and CrashFree BIOS, overclocking and system upgrade have never been easier.



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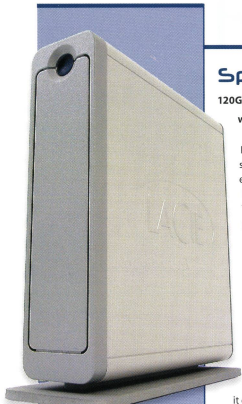
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www.cassa.com.au

ASUS
ASUSTeK COMPUTER INC.
<http://www.asus.com>



► **Heavy, man:** the robust metal housing adds to the drive's weight

Spacious but slow

120GB is ample room, but this USB 2.0 drive won't pick up any speeding tickets.

If you believe there's no such thing as too much storage space, LaCie is on your side. Its new d2 external drive puts an indulgent 120GB disk (from IBM's Deskstar 120GXP family) at your fingertips. The d2 meets most of LaCie's claims and has plenty of what you'd want, or expect, for the \$659 price tag.

Because the attractive brushed metal housing acts as one giant heatsink it's silent. Plus there's no need for a cooling fan — after a solid four-hour workout the case was barely warm.

While this gives the d2 a robust feel, the unit tips the scales at a whopping 1.5kg. Add to this a rather large external power supply, and you have a drive that's more cart than carry — more transportable than truly portable. At least the weight stops the device from toppling over, as it can be run vertical, flat or rack-mounted.

Where the d2 fails to impress is speed, or rather, the lack thereof. This is yet another USB 2.0 device that falls well short of the specs' promises. The USB consortium continues to tout a top speed of 480Mbit/s

LaCie d2 External Hard Drive

(60MB/s in real terms), and it's a claim echoed by every manufacturer of USB 2.0 gear in all their advertisements and press releases. The catch is that no-one seems able to make good on this pledge.

Under testing, the d2 achieved a peak transfer rate of only 224Mbit/s, or 28MB/s. To put it in simpler terms, we shifted a total of 1.6GB of data in just over two-and-a-half minutes. If USB 2.0 could live up to the promises, this time would be closer to one minute.

This is by no means a failing specific to the LaCie d2; it's a common trend in all USB 2.0 devices. FireWire drives, although officially rated at a slower 400Mbit/s, continually outperform USB 2.0 with sustained transfers at around 280Mbit/s (35MB/s).

The d2 also works through a standard USB 1.1 port, but its throughput drops to 96Mbit/s (12MB/s) so this is not recommended if you're in a hurry.

An extra 120GB of storage is appealing to anybody's eyes and to simply plug the d2 into a USB 2.0 port — where it's immediately recognised and ready to use — is

Details >>

Contact: LaCie

Phone (02) 9669 6900

Online www.lacie.com.au

Price \$659

Verdict ●●●●○

Ashley McKinnon

Maxtor Personal Storage 5000LE

Safe driving

Maxtor's latest external drive adds the convenience of one-touch backup and restore.

Maxtor has produced a number of external drive solutions in recent times, including the 3000LE seen in our recent hard drives Labs Challenge (APC September, page 74). That model was the precursor for this, the new 5000LE external drive solution.

The units look very similar, but there is an important change in this one — a single OneTouch Backup button, which some might mistake for a simple power switch. It is in fact wired to the host system and the bundled Dantz Retrospect Express software (for both Windows and Mac).

It's this feature that makes the 5000LE such an appealing backup solution, not to mention a handy additional storage space.

The drive's capacity is 80GB and the enclosure supplies a USB 2.0 interface. Installation is a doddle as Windows XP will immediately identify the drive

and make it available. If that's all you want from an external storage unit, then you can happily stop there, because the 5000LE is well up to that task.

But wait, as they say in those TV commercials, there's more. The default setting for Retrospect Express will mirror the entire contents of your hard disk, or just suck up the user-created data files.

It can also be customised with a script to selectively backup across local drives or the network. To kick it into gear, stab the OneTouch button or set a backup time in the scheduler. Peace of mind never came so easy.

So how quick is it? A 2.9GB backup took over 21 minutes to scan, backup and verify. Once the initial backup has been made, incremental backups take place in a blink of an eye, and restores are also very easy. Dragging and dropping files is even quicker — 60MB of JPEGs dumped from the hard disk to the 5000LE took just seven seconds.

In short, the only thing the 5000LE doesn't give you is an excuse for not backing up.

David Lin

Details >>

Contact: Maxtor

Phone (02) 9369 3662

Online www.maxtor.com

Price \$499

Verdict ●●●●○



► **One-button backup:** the easiest way to save up to 80GB of vital files.

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tank is running low. Plus the inks are formulated to deliver great results on low-cost plain paper. If your work takes you beyond A4 paper, the S6300 offers 17 ppm¹ performance with A3+ paper handling, ideal for spreadsheets, CAD and proofing work. The A4 models also offer superb 6"x4" and A4 borderless photo printing,² while all three models can produce banners or tile up to 16 pages together to create posters. For more information call 1800 021 167, visit our website www.canon.com.au or talk to your local Canon reseller.

Price shown is recommended retail price including GST. Canon® and the Canon logo are registered trademarks, and Bubble Jet is a trademark of Canon Inc. All other trademarks are the property of their respective owners. 1. Print speeds may vary with the content of the document & the processing speed of the host computer. 2. S6300 can print A3+ to trim down to A3 borderless. Specifications are subject to change without notice. Canon Australia Pty Ltd ABN 66 005 002 951. CIPG00103/A



iPod wannabe?

Is Creative's latest an innovative MP3 player or just an iPod clone?

Creative isn't shy about tagging the Zen as its "iPod killer", but it's more like a cover version of a classic. While fair enough on its own, it just doesn't compare to the original.

The old Discman-style form has been ditched in favour of a small rectangular shape, and battery life improved — repeated testing saw the unit clock just over 11 hours on the go. A few hours of recharging (substantially longer if you recharge via the USB port) and you're back in business. Zen's current capacity allows for 10GB of tunes in WMA, MP3 and raw WAV formats, with 20GB and 40GB models in the works.

The player supports both USB 1.1 and FireWire, but not the faster USB 2.0 pipeline. And FireWire is definitely the fastest way to fill those platters. USB 1.1's sluggish transfer speed meant uploading a 7GB block of MP3s took almost three hours; with FireWire it's barely half an hour.

► **10GB to go:** plenty of music, and 11 hours of battery life.

A jog wheel allows rapid scrolling and selection of tunes, but the amount of options on offer overwhelms the limited screen size. Furthermore, unless you create a series of customised playlists, your carefully structured music folder is going to be dumped onto the Zen in one long list.

Search functionality is available, as well as lookup via artist and other means, but skimming through a list of a couple of thousand songs via a jog wheel is an arduous task.

The control buttons reside on the left and right sides of the unit, while I/O ports (including a headphone jack) take up residence on the top edge of the Zen. But the buttons are easy to accidentally press, and can only be locked via the software menu.

However, Zen's clunky interface, the feeling that you're carrying around a fragile PC component rather than a media player, and the lack of an included remote control (it's an additional \$169) mean that the \$845 iPod remains a better buy.

Justin Kranz

Details >>

Contact Creative Labs
Phone (02) 9666 6100
Online www.australia.creative.com
Price \$799
Verdict ●●●●○

Microsoft Wireless Optical Desktop

True blue

This cordless keyboard/mouse combo puts Bluetooth on your desktop.

Bluetooth is largely considered part of the mobile computing landscape, but Microsoft's Wireless

Optical Desktop for Bluetooth puts this cable-killing technology on your desktop.

The keyboard has a good feel, with a soft travel yet a positive strike and return, although users with small paws will find the muscular

IntelliMouse Explorer less comfortable.

The Bluetooth dangle, which plugs into the PC's USB port, is actually a two-piece assembly: a Bluetooth transceiver, roughly the size of a cigarette lighter, nestled inside a small desktop cradle. A supplied direct-to-USB adaptor slips onto the bottom of the transceiver so notebook users can ditch the cradle. We'd have preferred a slightly larger Bluetooth transceiver with the USB plug built in.

The setup procedure is more cumbersome than for conventional cordless kit, but if you follow the instructions it'll all pan out well. One caveat: this gear runs only for Windows XP only, and in fact requires XP Service Pack 1 (which is included on the setup CD).

Bluetooth's touted 30 metre range is barely relevant to a keyboard, as beyond three metres you can't read the PC's screen. But the extra reach helps detect Bluetooth devices further afield. In testing, the unit picked up a Nokia phone and Palm handheld, each some 10 metres away behind concrete walls in different rooms.

While up to five additional Bluetooth devices can be linked to your PC, what you can do with them is currently limited to printing and dial-up networking via mobile phone. Microsoft intends to make additional profiles (such as handheld sync) available for download in the coming months.

Overall this works well, although it sometimes takes a nudge to wake the mouse from sleep mode; and even at 1Mbps, Bluetooth is still not fast enough for serious gaming, where nothing beats wires.

David Flynn

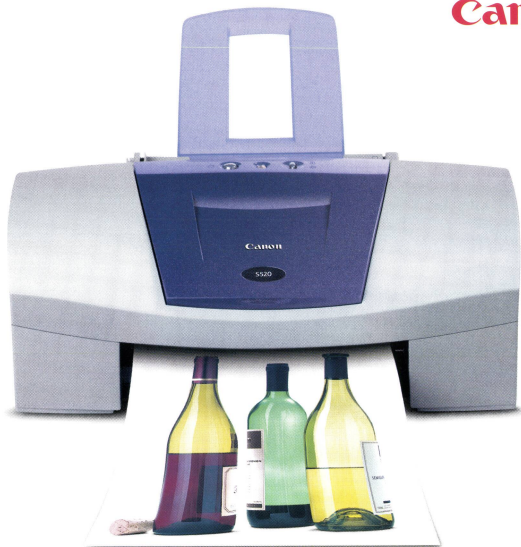
Details >>

Contact Microsoft Australia
Phone 13 20 58
Online www.microsoft.com.au
Price \$349.95
Verdict ●●●●○

► **Bluetooth bits:** seven devices can be connected via this Bluetooth hub.

You can...

Canon



There's one nearly empty. Do you throw them all away?

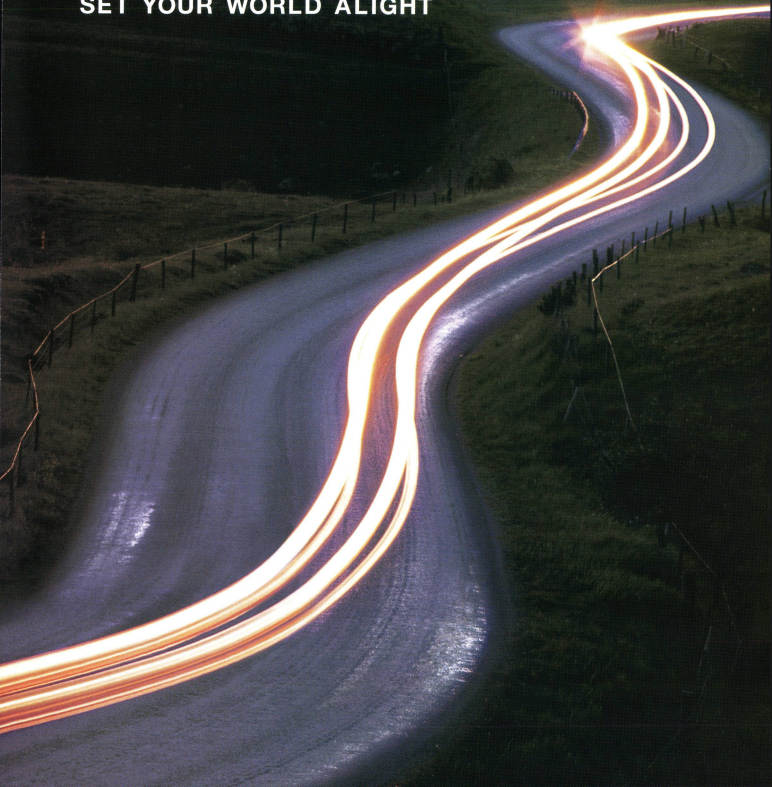
Many inkjet printers, even some quite expensive ones, combine several different ink colours into one cartridge. When one colour runs out, you have to throw away the whole lot. Most Canon models use inexpensive separate tanks for each colour. They also have an advanced ink monitoring system that alerts you

on-screen when any of the colours are getting low, so no more running out of ink halfway through a document. You'll find a new

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*RRP applies to Seca Ascent manual model only. Excludes dealer delivery & statutory charges. Metallic paint extra.

Page 107/136/104/102

Toshiba e330

A midlife upgrade to the e310 PocketPC, the e330 sports a new 300MHz XScale PXA-250 processor compared to the e310's 206MHz StrongArm powerplant. Onboard SDRAM also gets a boost, powering up from 32MB to a meaty 64MB. Externally, the e330 continues Toshiba's trademark slim design and also keeps its SD expansion slot. Once Microsoft optimises the PocketPC OS to take full advantage of the XScale architecture we should see some *real* performance improvements. And at \$949, the e330 is only \$50 more expensive than its slower sibling.

www.toshiba.com.au



Canon Digital IXUS V3

Canon's popular compact Digital Ixus camera range sees the release of the new V3 (priced at \$999). It's a direct replacement for the V2 and ups the CCD megapixel count from 2 to 3.2. Retaining the brushed stainless steel casing, it's about the most stylish digital compact on the market. Apart from the increase in capture resolution, the processor has been upgraded, allowing you to record video with sound.

www.canon.com.au



Brother P-Touch 2420PC

The \$199 PT-2420PC makes laminated labelling a little more interesting by adding the ability to include graphics, photos and symbols with the usual text thanks to supplied software and a connection to your PC. The software includes templates for making address, video and CD labels, among others. It's a label printer that can print almost anything you can create on the PC.

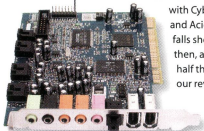
www.brother.com.au



Hercules DigiFire 7.1

The just-released DigiFire 7.1 digital audio card represents Hercules' salvo at the high-octane upgrader's market, with a heavy skew towards gaming and DVD entertainment. It features three FireWire ports and a separate output connector for headphones. The DigiFire ships with Cyberlink PowerDirector Pro 2.5 ME and Acid XPress software. Its 20-bit audio falls short of the Audigy 2's 24-bit, but then, at \$169 the DigiFire 7.1 costs around half the price of the Audigy. Watch for our review in next month's APC.

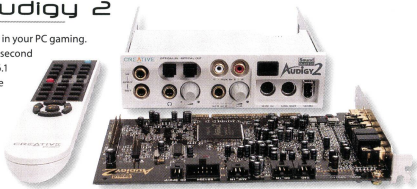
www.guillemot.com.au



Creative SoundBlaster Audigy 2

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Tech Briefing

Hyperthreading or just plain hype?

Hyperthreading technology has entered the consumer space but, asks Matt Overington, will it make any difference to day-to-day computing?

When APC first learnt that the 3.06GHz Pentium 4 was going to make use of Intel's Hyperthreading technology, the team went mild. Hyperthreading has been a part of the design spec of the Pentium 4 since day one, and Hyperthreading Xeon chips have been available since February.

The most significant architectural difference between the Xeon chip and the Pentium 4 is the Hyperthreading circuitry. The 3.06GHz Pentium 4 blurs the lines between server and desktop architecture. So now, the Hyperthreading push is not into the server space, but rather the consumer space.

HOW IT WORKS

Hyperthreading works by splitting processor loads into different threads and devoting specific areas of the chip to processing each thread. It enables different threads to be processed simultaneously, which in turn is supposed to lead to better multi-tasking performance. This is not a new idea though.

IBM already ships dual-core processors, and Sun has announced a dual-core UltraSparc to do the same task via hardware. Data is split into different threads and a separate core processes each thread.

Essentially a Hyperthreaded CPU has two "virtual" cores as opposed to two physical ones, but the same idea applies. However, as there's still only a single bank of cache memory, and one path for data to flow in and out of the processor, performance can't equal that of a dual CPU machine or dual-core CPU.

IT'S ALL IN THE NUMBERS

Intel has been very vocal about how the Hyperthreaded CPUs cannot be tested with conventional benchmarking applications. However, the biggest problem with benchmarking the new Hyperthreading architecture is that currently there are no benchmarking applications to leverage the new technology.

When the original Pentium MMX chips were released, benchmarks showed no performance boost over the classic Pentium CPUs because there were no applications available that made use of the extra time-saving MMX instructions. As programmers adopted the new instructions and applications, Pentium MMX processors eventually proved to be about 20% faster than the original Pentiums.

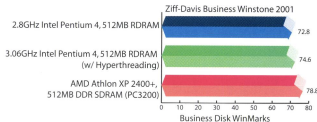
Today's benchmark results for the Hyperthreaded Pentium 4 are

actually quite negative. We noticed a performance decrease under Ziff-Davis Business Winstone 2001 with Hyperthreading enabled. One of the possible reasons for this lies in how the CPU decides to process the threads. If the processor is working on a single continuous thread, breaking it in half and cycling between each virtual core will show no performance benefit.

In fact, processor performance *decreases* with Hyperthreading turned on, because it takes time for the processor to break the processing load into two parts and then cycle between threads. This is processing time that would not normally be lost by a conventional CPU operating on a single thread.

Hyperthreading stands to make a small difference for people encoding videos and executing applications that place high loads on the processor while background processes still require execution.

The performance can't compete with dual-core CPUs, but the manufacturing costs are substantially lower. All new Pentium CPUs — from the 3GHz version onwards — will come with Hyperthreading



enabled, so the technology essentially comes for free when you buy a faster Pentium 4, and most motherboard and CPU configurations will have a provision to disable the Hyperthreading function.

The 3.06GHz Pentium 4 is still manufactured on Intel's 0.13-micron process, but Intel is moving to 0.09-micron lithography next year, which means there is more room on the CPU die to work with. This extra real estate can be filled with extra transistors, which will provide a more significant performance enhancement than pushing data around between virtual cores. There is no question that multi-thread processing is not going to go away, and is actually the next step in the evolution of Intel's CPUs.

Hyperthreading technology stands to leave AMD's Athlon architecture in the dust, but only time will tell. Either way, we won't see much in the way of performance enhancements over previous Pentium 4 or AMD architecture until the boffins figure out how to make the best use of Hyperthreading in their programs. Thank goodness programmers are a flexible, quick-learning bunch! [E119](#)

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CHP00146/upgrade



Egg freckles? Eat up Martha

Microsoft hopes that its Tablet PC will appeal to a new generation of punters unaware of the previous problems with the technology, says *Simon Tsang*.

That headline is drawn from painfully public lampoons of Apple Newton's handwriting recognition ability (or lack thereof) when the Newton arrived with equal parts hype and hope in 1993. In one series of Gary Trudeau's *Doonesbury* comic strip, the character Mike scribbles "Catching on?" in his newly acquired Newton, only to have it spit back "Egg freckles?" And in *The Simpsons*, one of Nelson's buddies attempts to write "Beat up Martin" in an unmistakable Newton-like device, which interprets it as "Eat up Martha". At least it got one word right that time.

I'm mentioning this because, once again, the whole issue of handwriting recognition has returned to centre stage. This time it's the arrival of Microsoft's Tablet PC platform.

With past failures ranging from the Newton to Microsoft's earlier efforts with Windows for Pen Computing, you would think any company with even just a slight grip on its sanity would have written this off as a lesson well learnt, and moved on.

Well, Microsoft moved on, but the concept kept humming away in the background. After all, it's a personal pet of Bill Gates, who for the last ten years has been telling us that pen-based computing is

If you keep well abreast of technology, and can recall the many failed efforts of the past decade, the Tablet PC will be a hard pill to swallow. Those people will be Microsoft's toughest critics.

Then there are those who know little of pen computing's chequered history. To them, the Tablet PC is just a new type of computer, and they'll expect it to be like any other modern desktop or notebook. So they'll just pick up the thing and expect it to work without any hassles. And part of that expectation will be that its handwriting recognition should be 100% accurate.

Of course, we all know that it isn't. And while Microsoft and its Tablet PC partners are downplaying handwriting recognition and talking up the concept of digital ink, a lot of people will end up running back to pen and paper, or the keyboard, after ten minutes with a Tablet PC.

My wife will be one of them. She's pretty comfortable with a PC and even her Palm handheld, but has no experience with tablet-style devices. So I took one of the Tablet PCs home for her to try.

Also, being Korean, she could give the Asian text input a go. That was something I really wanted to see, since Microsoft has made much of the fact that that four of the seven languages in the Tablet PC's first release

... the only way I can see the Tablet PC breaking into the mainstream is when it can meet the expectations of the average PC user

just what we all need. This month, the Tablet PC finally arrived. Is it actually ready now, or is it still a concept that's a further ten years away from maturity?

After poring over reams of backgrounders, whitepapers, press materials, datasheets, reports and reviews, as well as spending time using the devices, I've come to the conclusion that the public isn't ready for the Tablet PC.

It's not purely a question of the technology, the market positioning or even the price, although all those factors exert some influence. Especially the price, which puts the Tablet PC well above the cost of a notebook that has more features and is far more capable. Whether the Tablet PC itself is a dud or a dynamo has little to do with it. There's a deeper psychological hurdle that Microsoft and its hardware partners must overcome.

When the Tablet PC comes up in conversation, I find people belong to one of two camps — those who know what it's about, and those who don't. Before you suggest that's from the school of the bleeding obvious, let me explain why this is significant.

were Asian. What struck me while trying to set up Korean handwriting support is that it wasn't easy to find the text input system. It may have something to do with the preproduction unit we had, but it took several attempts before the language toolbar decided to reveal itself.

Then I noticed that the only way of getting the Tablet PC to recognise Korean handwriting was to enter it stroke-by-stroke in the input panel. Forget about Digital Ink, and writing anywhere on the screen in the Tablet's Journal application.

I watched with some amusement as my wife attempted a cursive style Korean script which came nowhere near to being recognised. She had to resort to "baby scratching" each individual stroke before the Tablet PC had an inkling of what she meant. It was all too time intensive, too frustrating.

What this amounts to is that the only way I can see the Tablet PC breaking into the mainstream is when it can meet the expectations of the average PC user.

And that's probably still ten years away, Bill.
stsang@apcmag.com

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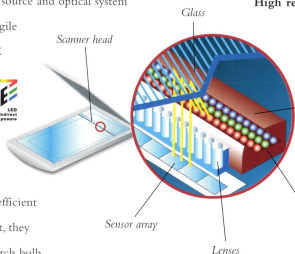
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Canon N1240U shown actual size.

Looking good

LCD screens look stylish but they can't match CRT monitors for resolution, quality and accuracy. *Simon Tsang and Ashok Zaman* test 14 of the best big-screen displays for professionals and power users.

Sometimes bigger really is better. And sometimes the original is the best of all. When it comes to monitors, both these old ideals apply. Despite the surge in popularity of LCD panels, and their undeniable advantages in style and space-saving, CRT (cathode ray tube) monitors remain the choice of serious users such as designers, content creators, video editors, engineers and gamers.

The first and most obvious advantage of the CRT display is resolution. The best image you can get from an LCD panel usually limits you to the screen's native resolution — often the highest on offer — while other resolutions must be rescaled using tricky interpolation techniques which degrade the image. Not so with CRTs, which can display the widest possible palate of resolutions.

Colour and greyscale reproduction is also superior in CRT monitors, which are capable of distinguishing finer gradations of colour change displayed against a solid black background and with better contrast than LCD panels.

And anyone who deals with fast moving graphics (especially gamers) will benefit more from a CRT display — not just because of the flexibility of resolutions, but because LCD displays suffer from motion after-effects due to the slow response time of the pixels that make up the display panel.

CRT technology has its technical limitations; the picture has less sharpness and brightness than LCD screens, and the tube can suffer from geometric distortion. But these are small trade-offs for the overall image quality and flexibility. And the days of big-screen monitors being accompanied by a big price tag are long gone, making a quality 19in CRT monitor an affordable proposition for the home buyer and professional alike.

You want proof? APC called in 14 CRT displays from a variety of vendors. All were 19in models, which represents the mid-point for screen size, quality and wallet-friendliness.

The best of these displays are flat CRTs, which are unbelievably affordable compared to prices just a year ago, with most displaying a good 19in standard resolution of 1,280 x 1,024 pixels at a stable refresh of 85Hz. Some also come with extra features like USB ports and dual inputs.



Sony CPD6420

Sony remains the king of the CRT display world, and the CPD6420 shows why. Its FD Trinitron flat aperture grille picture tube is the mantle for success in all its flat-CRT displays, and is the decisive factor here.

With a 0.24-0.25mm grille pitch 18in viewable screen, the image quality is simply stunning. It displays an incredibly rich and vibrant image, strong colours and a very clear white — all at the standard monitor colour temperature of 9,300 Kelvin.

Equally impressive is the Sony's capacity to render fine image detail with extraordinarily crisp fidelity, displaying nice clean fonts at all point sizes.

DisplayMate testing failed to betray any significant shortcomings in the Sony unit. Geometry tests reveal well-proportioned screen objects, both in the centre and corners of the screen. Minimal adjustment of brightness and contrast was required out of the box before testing, and colour gradients were accurately reproduced with vivid clarity without signal degradation at the display edges.

Greyscale reproduction showed smooth black to white transitions, though a slight trace of blue was detected in the colour tracking greyscale. The some moiré test screen picked up moiré interference, although in general usage its impact on the display image was minimal.

The chassis is slick and understated with a relatively short neck for a 19in monitor. The OSD is simple to navigate with a discreet two-button control on the lower bezel.

Other features include one upstream and four downstream USB ports, dual switchable inputs between the D-sub and BNC connectors, and Sony's picture effect, with preset picture modes for Standard, Dynamic or Professional, all at the touch of a button.



Details >>

Tube technology Trinitron flat aperture grille

Viewable diagonal 18in

Dot/grille pitch 0.24-0.25mm

Inputs D-Sub, BNC

Max resolution

1,920 x 1,440 at 70Hz

Dimensions (HWD) 471 x 451

x 461mm

Weight 25.5kg

Contact Sony Australia

Phone 1300 137 669

Online www.sony.com.au

Price \$999

Verdict

✓ Highly superior image clarity.

✗ Slight moiré apparent in the moiré test screen.





Acer AC901

It's a pity that there's such a limited range of Acer-branded CRTs now that BenQ has taken over most of Acer's former communications and multimedia division's products, including monitors.

There are only three monitor models left under the Acer brand — 15in, 17in and 19in — and all are curved shadow-mask displays. For the more expensive flat CRT line-up, Acer Australia distributes Mitsubishi Diamond Pro models in 17 and 22in sizes.

The shadow mask AC901 is a real bargain product, that rivals CTX's PL9 in almost every category we tested. The scores were neck and neck all the way. Not surprisingly, the final ratings for both are a respectable four out of five. Like the CTX PL9, the AC901 caters for the budget conscious while still delivering a mid-range quality image.

No significant weaknesses stood out — however one criticism APC has is that the Acer's black level adjustment is a bit inadequate. Turning the brightness down so that the black background is solid black meant that lit areas were rather dull.

Increasing the brightness and contrast until the foreground is at the proper luminance also lights up the darker areas, preventing you from getting a true black.

It's a trade-off that more expensive monitors don't have to make.

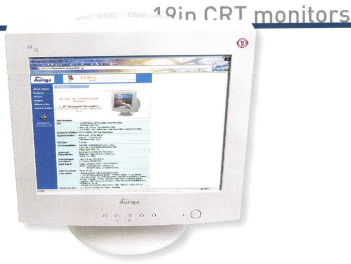
The menu layout is neatly arranged and intuitive to use. Using left and right pointing buttons to navigate, it's easy to switch between two related functions at once — such as horizontal size and position — without needing to exit back out to the main menu.

Details >>

Tube technology Shadow mask
Viewable diagonal 18in
Dot/grille pitch 0.26mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 85Hz
Dimensions [HWD] 452 x 452 x 447.8mm
Weight 20.4kg
Extras n/a
Contact Acer
Phone 1300 366 567
Online www.acer.com.au
Price \$542

Verdict

- ✓ Quality viewing at a bargain price, easy to use OSD.
- ✗ Black level adjustment.



Auriga 19TF

It wasn't so long ago that the only commonly available flat-CRT technologies were variations on aperture grille tubes. More recently, a great number of shadow mask monitors — the older, rounded screen technology — have been appearing in the flat-CRT form, mostly occupying the entry-level end of the market.

The Auriga 19TF, with its 19in shadow mask flat-CRT screen, is a prime example. Serious screen real estate is light on the pocket with this model, but don't expect it to be the choice plot on the block. You only ever get what you pay for, and the 19TF pulls up short in a number of departments.

Using the setup screens in DisplayMate to fine tune brightness and contrast while tweaking the display failed to rescue the onscreen image from a yellowed, dull and slightly blurred appearance. Curiously, adjusting the colour temperature from the standard 9,300 Kelvin to the preset option "US" cleared the yellowed appearance somewhat, but it was no match for the clarity of the Sony display, used as the Labs Challenge yardstick.

This did not bode well for the 19TF in the DisplayMate test screens, and while it could hold its own in most of the Geometry tests, tests involving sudden variations in Average Picture Level (APL) (where shifts in greyscale brightness occur in response to large blinking picture blocks) or screen regulation (where thin borders are distorted by large colour blocks) show up the inferiority of the electronics behind the Auriga unit.

Similarly, colours were affected by the yellowed appearance of the screen at the test settings, and some streaking and ghosting was there in DisplayMate.

Details >>

Tube technology Flat
Viewable diagonal 18in
Dot/grille pitch 0.22mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 75Hz
Dimensions [HWD] 456 x 466 x 453mm
Weight 22.5kg
Contact AKA Technology
Phone 1300 655 911
Online www.go4auriga.com
Price \$465

Verdict

- ✓ Flat screen for a cheap price.
- ✗ Dull picture quality.



Shadow mask vs Flat-CRT

Before delving into the details of each display type, it's important to note that you should *never* skip on your monitor. All too often, the monitor isn't given enough priority when budgeting for a new system. Buyers obsess over clock speeds, what type of video card they can get and how big the hard drive is. But remember that the screen is the one component you'll be looking at every minute you're in front of your PC. And it's likely to be the most long term component of your system — most people upgrade and replace their PC more often than the monitor.

Standard shadow mask

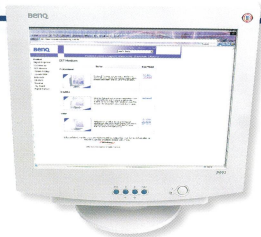
Essentially, shadow masks use a perforated alloy sheet (called Invar), sitting behind the glass, between the electron beam and RGB phosphor trios, aligned precisely to allow the appropriate beam to hit either the red, green or blue phosphors. The dot-pitch of a shadow mask is the diagonal distance between two phosphors of the same colour.

You'll notice, while reading through this Labs Challenge, that the standard shadow mask monitors with curved display surface trail a long way behind the flat-CRTs in many respects. When flat-CRT technology was new, shadow masks occupied both the high and low end of the buyer's market. Now they're exclusively a budget deal and, arguably, the electronics and build is of a lower standard compared to the best shadow masks of three years ago.

Flat-CRTs

The main flat-CRT technology is aperture grille, more recently joined by various flat shadow mask display units. Aperture grilles are almost exclusively high-end displays, known for superior brightness and improved sharpness, evident in the outstanding Trinitron tube, present in Sony CRT monitors and others. The phosphors are suspended on vertical wires, held in place by horizontal damper wires that are actually visible if you look closely (some people find this annoying). The principle is the same, although the beam does not have to be as powerful, reducing the gaussian spread that affects sharpness.

Grille-pitch is the horizontal distance between vertical wires, and is equivalent but not directly comparable to dot-pitch. Due to the flat display, the electronics controlling the electron beam path are more complicated when reproducing straight lines and proportioned objects. Geometry was a weak point in early models, but not so today.



BenQ P992

Formerly known as Acer Communications and Multimedia, the BenQ brand is a relative newcomer. Although Acer still has a presence in our Labs Challenge, BenQ has taken over responsibility for most of Acer's peripheral and multimedia products in this region. BenQ's submission, the P992 falls into the entry-level category, despite the fact that it's billed as its professional unit.

Featuring a shadow mask flat-CRT tube, with 18in viewable screen and 0.25mm dot-pitch, the P992 is a very sound offering considering the highly-competitive asking price of \$549. However, when matched against the Sony CPD-G420 yardstick, the difference in image quality is immediately apparent. It lacks the high-contrast vibrancy and brightness of the Sony unit, fonts aren't as sharp and colours are plain in comparison.

Throughout DisplayMate testing, the BenQ monitor neither excelled nor fell over in any one test or category of testing, with average outcomes across the board.

Setting up the P992 did present some issues. After plugging the captive D-Sub cable to our test machine, the BenQ required extensive tweaking of the screen geometry to display an evenly shaped, straight edged screen image that filled the available space.

Even so, the end result was not quite satisfactory; with a very slight pincushion-like curvature of the image in the top left corner that would not disappear.

The screen is framed within a reasonable-size bezel and it features a four-button interface for the on screen display, which works well for browsing the standard range of calibration options.

Details >>

Tube technology Flat
Viewable diagonal 18in
Dot/grille pitch 0.25mm
Inputs D-Sub
Max resolution 1,600 x 1,200 @ 78Hz
Dimensions (HWD) 466 x 455 x 463mm
Weight 21kg
Extras n/a
Contact BenQ Australia
Phone (02) 9714 6800
Online www.benq.com.au
Price \$549

Verdict

- ✓ Decent quality at a reasonable price.
- ✗ Lack of sharpness and brightness.



Jane has just lost an important sales report due to...

- a) a computer virus?
- b) an application error?
- c) a power surge?

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Power problems are the largest cause of data loss

Power disturbances are the largest single cause of data loss, accounting for 45.3 per cent of all problems. Source: Contingency Planning.



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John Nagle, Owner of Logos, New Zealand



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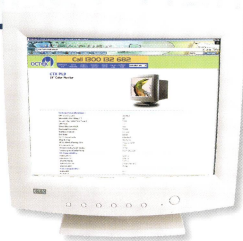
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www.apc.com



CTX PL9

The PL series is CTX's mid-range CRT product line and consists of a 17in model and the one reviewed here, the 19in model. The next level up buys you into the "Executive Series" with flat CRTs. For a curved screen, however, the PL9 performed remarkably well throughout testing and comfortably preserves CTX's buyer-friendly reputation.

At just \$499, only the Auriga 19TF is cheaper in this Labs Challenge, yet the PL9 scored comfortably in the mid-range throughout most of the evaluation criteria. Very little distortion was detected, apart from a small amount in the top-right corner of the screen.

Minor streaking was also visible, though it will largely go unnoticed in most day-to-day applications. The display appeared to have a darker patch in the bottom right-hand corner which detracted from its overall score in the uniformity tests.

The PL9's menu system employs a split-pane style view with main categories on the left and individual functions on the right, so it's easy to access all adjustments.

Six buttons located in the screen's curved bezel are used for navigation, with the menu exit doubling as the degauss.

One design flaw concerns the stand and the shape of the lower rear portion of the housing. When the monitor is tilted all the way up, the base of the rear end can hit the table, even though it has a relatively short overall depth. This is a rather major oversight.

Otherwise, the CTX PL9 is excellent value, and the overall image quality is above what its asking price may suggest.

Details >>

Tube technology
Shadow mask
Viewable diagonal 18in
Dot/grille pitch 0.26mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 75Hz
Dimensions (HWD) 456 x 460 x 453.5mm
Weight 19.5kg
Contact
Ocean Office Automation
Phone 1800 637 022
Online www.octek.com.au
Price \$499

Verdict

- ✓ Low price, good image quality.
- ✗ Poor stand/base design.



HITACHI CM721F

Hitachi only offers five models in its entire CRT range of monitors in Australia. By comparison, its TFT division carries nine models. The skew towards flat panels shows Hitachi's change of direction. There are two 19in models in Hitachi's CRT family. The CM721F reviewed here is higher up the pecking order, being the flat screen model and around \$150 more than the CM715 "general purpose" unit.

Although this unit has a capable display, you wouldn't guess it from its plain, boxy exterior. In fact, about the only surface that's not flat is the circular swivel base. Image quality is on par with most other mid-range CRTs, though it's still no match for the Sony CPDG420 in brightness, contrast and clarity.

Its strongest quality is its minimal geometric distortion — even out-doing the Sony in this test category. The edges of the screen are about as true as CRT technology can get, and only minor adjustments of the geometry controls were required.

However the controls let down the Hitachi — not that the onscreen menu and four button layout is the worst we've seen, but the inappropriately named "EasyMenu" is anything but. With the functions arranged in a circular pattern, relying on left/right pointing buttons to navigate, the fact that directions become reversed when you're at the bottom of the circle shouldn't have escaped the notice of the engineers.

The CM721F is a sensible buy for those wanting a little more than the bargain basement offerings, and is well worth the small premium you'll pay.

Details >>

Tube technology Flat
Viewable diagonal 18in
Dot/grille pitch 0.20mm horizontal
Inputs D-Sub
Max resolution 1,600 x 1,200 at 75Hz
Dimensions (HWD) 469 x 452 x 462mm
Weight 23kg
Contact Hitachi
Phone 1800 032 489
Online www.hitachi.com.au
Price \$799

Verdict

- ✓ Very little geometric distortion, good image quality, well priced.
- ✗ Clumsy OSD controls.





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Hyundai ImageQuest P910+

The ImageQuest P910+ isn't one of Hyundai's crowning achievements, and it's only suited to those after the largest screen for the least amount of money. Impressions are that the curved shadow mask tube lacks depth and contrast in colours, appearing "washed" to the naked eye. The DisplayMate tests only served to confirm these initial findings.

Other drawbacks included a noticeable geometric distortion in the form of bowing at the top and bottom edges of the screen (that no fiddling with the adjustments could correct). And that's in spite of myriad tuning options offered in the onscreen menu, including distortion correction for the top and bottom corners. The menu itself is rather cluttered by the extensive array of controls and disappears too quickly when you're trying to figure out what all the tiny icons mean. A layered or tabbed menu system would've served much better here.

The P910+ was slightly redeemed by its performance in the vertical resolution and focus tests — which were quite reasonable considering the shadow mask has a dot pitch of 0.26mm. This meant even small fonts down to 6.5pt are still legible at the test resolution of 1,280 x 1,024. However, pronounced moiré patterning marred an otherwise acceptable result Sharpness and Resolution.

Although the ImageQuest P910+'s recommended price is \$599, you can easily find it cheaper online, making it a bargain basement buy for a 19in monitor. But unless you have a dire need for the extra screen real estate, you're better off buying a top quality 17in unit.

Verdict

- ✓ Cheap, reasonably sharp.
- ✗ Lacks colour depth and intensity, moiré pattern effect, distortion.

Details >>

Tube technology
Shadow mask
Viewable diagonal 18in
Dot/grille pitch 0.26mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 85Hz
Dimensions (HWD) 468.5 x 446 x 465.5mm
Weight 19kg
Contact Synnex
Phone 1300 880 038
Online www.synnex.com.au
Price \$599



LaCie electron19blue III

The LaCie electron19blue III represents the third iteration of this particular series, and the main improvement over version II is better colour reproduction. Curiously, it has 10Hz lower refresh at maximum resolution than the superseded model and, according to the manufacturer's specs, a slightly larger dot pitch.

As the most expensive monitor in this comparison, LaCie is aiming this at the professional graphics market. The electron19blue III outscored the Sony G420 in the Geometry and Distortion, and Colour and Greyscale tests, conceding only in Sharpness and Resolution. The Sony still looks crisper in this respect, but only just.

A broad range of adjustments are available via the OSD for heaps of tweak, from compensating for pincushion distortion at the top and bottom corners independently, to calibrating horizontal and vertical colour registration.

Even the colour purity in the corners of the screen — a weak point in most CRTs — can be virtually eliminated through its controls. But the seven-button layout used to access the menu functions is a little excessive and could be simplified to make it easier to use.

An optional "blue eye" hardware calibrator is available for \$759 and allows you to directly calibrate the blue, red and green guns inside the tube as a ColorSync profile. A fold-up hood is supplied to reduce glare and reflections.

If you are working in the graphics profession, or value high quality colour reproduction above all else, take a serious look at the electron19blue III.

Details >>

Tube technology
Diamondtron flat aperture grille
Viewable diagonal 18in
Dot/grille pitch 0.25/0.27mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 75Hz
Dimensions (HWD) 442 x 450 x 445mm
Weight 25.5kg
Contact LaCie
Phone (02) 9669 6900
Online www.lacie.com.au
Price \$1,399

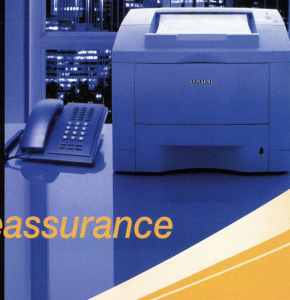
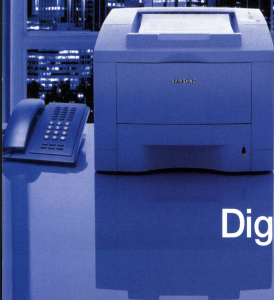


Verdict

- ✓ Excellent colour reproduction, high quality image, pleasant design.
- ✗ Not as sharp as the Sony.

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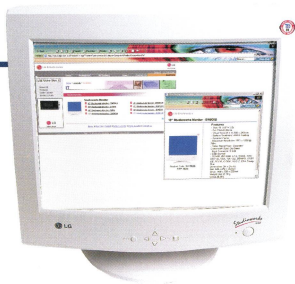
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LG Studioworks 900B

LG has an extensive range of CRT monitors, including two 17in Flatron models with flat-CRTs. The 19in product, however, stands alone with a single model on offer in Australia, utilising a conventional shadow mask tube. It's the biggest in the Studioworks series, but not the most expensive CRT that LG produces. Its own 17in Flatron F700P costs \$34 more, despite the obviously smaller screen.

What has all this got to do with the Studioworks 900B reviewed here? Positioning. Although LG is delivering a lot of screen real estate for the money, the company hasn't opted for a high-end CRT to cater for the professional market. Instead, it has delivered a mix of mid-range features at a respectable price-point that's sure to please the mainstream. It's not an image-builder for the brand, but neither is the 900B cheap and nasty.

One of its better features is a sensibly designed onscreen menu system that uses a four-way set of directional buttons to charter its tabbed interface. The range of adjustments provided are adequate — a better range of controls than some — but certain distortion traits in the screen could not be corrected, such as a drop in the left hand corner of the screen. There's also a bit of bowing effect at the upper and lower edges, in addition to slight

linearity problems on the right hand side spotted during the Corner Circle Matrix test. Colour registration is also not as spot on as it could be and the 900B had issues with colour uniformity on the right half of the display

These problems aren't unique to the 900B in the \$600-\$700 price range, although there's nothing which distinguishes it from the crowd.

Details >>

Tube technology Shadow mask

Viewable diagonal 18in

Inputs D-Sub

Dot/grille pitch 0.26mm

Max resolution 1,600 x 1,200 at 75Hz

Dimensions (HWD) 454 x 448 x 470mm

Weight 20.3kg

Contact LG Electronics

Phone 1800 643 156

Online www.lge.com.au

Price \$614

Verdict

- ✓ A reasonable all-rounder, good menu layout.
- ✗ Slight geometry and colour uniformity issues.



Mitsubishi Diamond Plus 935B

Mitsubishi monitors have been immensely popular with PC makers — the DiamondView range offering a happy combination of image quality and value. The Diamond Plus 935B is a departure from the clunky look and feel we are used to seeing from the company and is now replaced by a stylish, flat grey bezel.

The cabinet houses Mitsubishi's SuperBright Diamondtron aperture grille picture tube, 18in viewable display and a steady 85Hz refresh at the test resolution of 1,280 x 1,024. It's also capable of displaying resolutions up to 1,920 x 1,440 at 60Hz. It features a two-step button-activated adjustment, enhancing brightness and clarity of the display image.

Very little adjustment was needed out of the box, although the colour convergence was a trace out of sync. Unlike many monitors, convergence controls are available in the OSD, and some correction was made but it was too difficult to eliminate completely. DisplayMate revealed a small horizontal elongation of circles in Screen Framing and Aspect Ratio tests, but apart from that the overall screen geometry was satisfactory.

The image lacks sharpness, fonts appearing slightly blurred, with sub-pixel colour timing and registration, though colour reproduction was a strong point.

This is a tad disappointing. Despite its good points, the lack of performance in the sharpness and convergence areas is noticeable. While it hails from a credible Diamondtron background, the Diamond Pro is a finer example of what Mitsubishi is capable of.

Details >>

Tube technology Diamondtron flat aperture grille

Viewable diagonal 18in

Dot/grille pitch 0.25mm

Inputs D-Sub

Max resolution 1,920 x 1,440 at 60Hz

Dimensions (HWD) 440 x 446 x 448mm

Weight 21.2kg

Contact Mitsubishi Electric

Phone (02) 9684 7777

Online www.mitsubishi-electric.com.au

Price \$1,179

Verdict

- ✓ Stylish and solid.
- ✗ Lack of sharpness, colour convergence issues.





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NEC MultiSync V930

The NEC MultiSync V930 is one of the few entries in the Labs Challenge that features the standard shadow mask CRT tube, making it strictly for the budget buyer who doesn't mind a curved CRT screen. The shadow mask CRT has quickly been superseded by flat-CRTs as the de facto standard in the general CRT display market. Even though the NEC's DisplayMate scores are lower overall, it's not without its good points.

The 18in viewable screen is capable of resolutions up to 1,600 x 1,200 pixels displayed at 76Hz, framed in a very plain, clone-like cabinet. Although it required only a few adjustments to set up for testing, the five-button OSD interface is not the most intuitive to operate. While the OSD itself is easy enough to follow, the buttons are not clearly marked and some guesswork is needed to get started.

Geometry tests showed reasonably well formed objects — something that shadow mask displays had over aperture grille monitors until recently. Similarly, primary colours were on the mark, though they lacked brightness, and decent power supply to the signal electronics ensured little greyscale variation in Average Picture Level testing.

Where the NEC's performance wasn't so good was in sharpness and resolution testing, revealing a lack of focus and sharpness while displaying fonts. It also had a "beating" moiré interference pattern at the top right-hand corner of the screen.

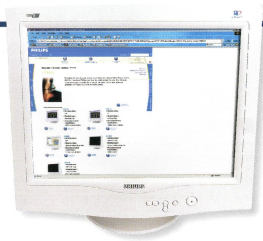
If you are not attached to a flat screen, the MultiSync V930 may be an option, though you are advised to shop around before making your purchase decision.

Details >>

Tube technology Shadow mask
Viewable diagonal 18in
Dot/grille pitch 0.26mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 76Hz
Dimensions (HWD) 454 x 461 x 472mm
Weight 20.4kg
Contact NEC Australia
Phone 13 16 32
Online www.nec.com.au
Price \$539

Verdict

- ✓ Budget price.
- ✗ Screen curve very noticeable.



Philips 109B

Philips is the one brand that consistently threatens to knock Sony off its perch. However, its professional model, the Brilliance 109P20 aperture grille CRT, was not submitted to our Labs, instead Philips opted for the 109B flat shadow mask model. This model is aimed at the business market and isn't endowed with the same image quality of the 109P, leaving Philips a little under-represented.

The 109B is significantly marred by moiré interference patterns at the standard test resolution of 1,280 x 1,024 (looking much like ripples in a pond) which could not be alleviated satisfactorily by adjusting horizontal or vertical moiré controls. It also causes visible thatch-like patterns wherever dark or medium shades of grey are displayed.

Unfortunately, this had an adverse effect on the display of fonts, which appeared to shimmer. Interestingly, moiré can sometimes be a result of excellent focus, and in most other respects the 109B is a good monitor, reasonable in brightness with solid colour and greyscale reproduction. Similarly, screen geometry was solid in DisplayMate testing, showing well proportioned screen framing, circles and straight lines.

The 109B features Philip's LightFrame 2 technology, allowing users to highlight regions of the screen for enhanced clarity and brightness, which, in spite of the moiré, worked well. A user-friendly, five-button OSD interface neatly occupies the curved lower bezel, and USB ports are optionally available with an alternative base.

The 109B would fulfil the business role exceptionally well, were it not for the moiré pattern detracting from Philips' usual high quality.

Details >>

Tube technology Flat
Viewable diagonal 18in
Dot/grille pitch 0.25mm
Inputs D-Sub
Max resolution 1,920 x 1,440 at 60Hz
Dimensions (HWD) 440 x 446 x 468mm
Weight 21.2kg
Contact Philips Australia
Phone 1300 363 391
Online www.philips.com.au
Price \$629

Verdict

- ✓ Solid colour, compact design.
- ✗ Couldn't eliminate moiré interference.





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Samsung SyncMaster 955b

Samsung certainly seems to have taken the monitor market by storm over the past few years, no doubt due to the company supplying decent quality monitors at extremely competitive prices. Vendors and system integrators also appear to have gravitated towards Samsung displays, as proven in our PC megatest last month (APC November, page 75).

The SyncMaster 955b falls under Samsung's Graphix Pro Series of monitors, though this probably has more to do with the size of its display than the features. Its maximum resolution of 1,600 x 1,200 is only achieved at a lowly 68Hz refresh, and even running it at 1,280 x 1,024 only improves things a little at 75Hz.

Although the overall image quality isn't bad, the 955b was wanting in areas of black level adjustment and brightness. If you crank the brightness up to an acceptable level, it's difficult to keep a true black background. This can make images either look dull or oversaturated.

Also, there was some slight distortion at the upper left corner of the screen and distinct screen regulation problems. Minor bowing was also evident at the top and bottom of the display, but otherwise the geometry and available corrective adjustments ensured a relatively distortion-free image.

Colour registration, however, was near-perfect. A small extra feature that's been thrown into the 955b is the "Highlight Zone", which brightly illuminates a portion of the display. You can set the whole screen as a Highlight Zone, though we don't recommend this if you value your retinas.

Overall, not a bad display, but there are better value monitors out there.

Details >>

Tube technology Shadow mask
Viewable diagonal 18in
Dot/grille pitch 0.22mm
Inputs D-Sub
Max resolution 1,600 x 1,200 at 68Hz
Dimensions (HWD) 461 x 440 x 454mm
Weight 19kg
Contact Samsung
Phone (02) 9763 9700
Online www.samsung.com.au
Price \$669

Verdict

- ✓ Excellent colour registration, cheap.
- ✗ Limited refresh rates, black level adjustment.



Viewmaster MF908

The Viewmaster MF908 matches Sony and Mitsubishi in the maximum resolution stakes, but that's where any similarities with either high-end flat CRT monitors end.

It performed poorly in the screen regulation test, consisting of blinking blocks of various sizes surrounded by a thin-lined border framing the extremities of the screen. On a good display, the border pretty much remains the same size, while a bad one will cause it to expand and contract wildly — which is what happened with the Viewmaster.

Another area where we found the MF908 lacking was in colour uniformity across the screen. Dark patches were evident everywhere, with a slight green tinge towards the left side of the screen when viewed with a white background. The Viewmaster also suffered from a higher than average level of reflection and glare from the glass. Correcting the moiré pattern effect proved too much of a challenge for the MF908, despite adjusting the controls for this purpose. Thankfully, it redeemed itself a little with minimum distortion and good colour registration.

The onscreen menu is identical to the "EasyMenu" found in the Hitachi CM721F, but uses only three buttons to navigate instead of the Hitachi's four. The case design is predictably plain for an entry-level model and the base rotation is limited to only 90 degrees.

But the Viewmaster MF908 isn't all bad. It's the cheapest flat screen CRT in this test, and for some, that may prove to be of greater value than a few shortcomings in the overall quality stakes (which may or may not be evident throughout daily use).

Details >>

Tube technology Flat
Viewable diagonal 18in
Dot/grille pitch 0.26mm
Inputs D-Sub
Max resolution 1,920 x 1,440 at 60Hz
Dimensions (HWD) 452.3 x 455.4 x 466.8mm
Weight 24kg
Contact Hallmark
Phone (03) 9540 8555
Online www.hallmark.com.au
Price \$535

Verdict

- ✓ Cheapest flat screen CRT.
- ✗ Problems with screen regulation, colour uniformity and moiré pattern.





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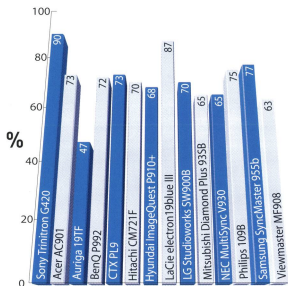
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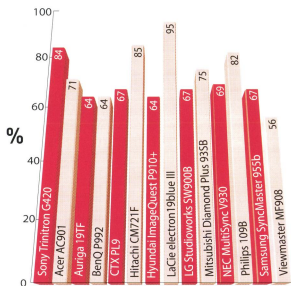
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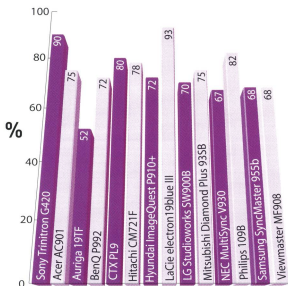
Colour and greyscale



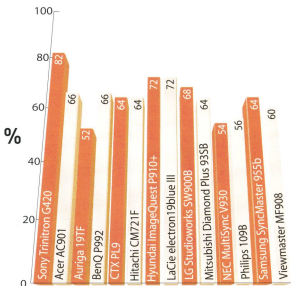
Geometry and distortion



Setup and display



Sharpness and resolution



How we tested

All monitors were tested on a common Pentium 4 1.7GHz PC with 256MB of RAM and equipped with a Matrox Millennium G550 dual-head graphics card. The dual-head setup allowed us to compare two monitors at the same time — with the Sony Multiscan G420 permanently set up as the reference display. Each monitor tested was allowed at least half an hour warm-up time before being subjected to the comprehensive suite of DisplayMate tests (www.displaymate.com).

Evaluations were made in four main categories, covering Display

Setup, Geometry and Distortion, Colour and Greyscale, and Sharpness and Resolution, with between 10 and 12 sub-categories in each. The individual scores were tallied and combined with a features component — that takes price into account — to obtain the final score which became the basis for the overall star ratings.

The monitors were also used with everyday Office applications, viewing hi-res images and Web browsing.

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Mini Memory

USB memory keys are the ultimate in cool tools.

We've rounded up nine of these pint-sized wonders to find the best in speed, features and value.

Let's face it: the floppy disk has had its day. 1.44MB just doesn't cut it anymore in this age of broadband downloads, digital pictures, MP3 tracks and video clips. Even software drivers are regularly coming above 2MB. And you're more likely to find a PC without a floppy drive than without a USB port.

That's why USB memory keys make so much sense. For sheer convenience and ease of use, nothing comes close. Small enough to be carried in your pocket (we've shown their photos as actual size) or swinging from a keychain, they're the ideal mobile storage solution.

In fact, memory keys are becoming more than just a handy mobile storage device. In the US, some Dell notebooks now come with a 16MB or 64MB memory key instead of a floppy drive.

While you can buy memory keys as small as 16MB, larger sizes are more common and represent better value: we found 128MB to be the "sweet spot". But not all memory keys are created equal.

Prices for 128MB models range from just over \$100 to almost \$300. Some pack in the memory but take shortcuts on robust construction. Others come with various forms of security, from write-protect switches to software that password-protects part or whole of the device (although if this software runs on Windows only, it could pose a problem for transferring files onto a Mac).

Speed is another factor, with some keys taking twice as long as others to transfer exactly the same files.

If you intend to use your memory key as an emergency recovery tool, make sure both the key and your PC's USB ports support booting. Finally, be aware that due to the way storage is measured, a memory key labelled as 128MB may have a true capacity of around 125MB.

How we tested

The nine contenders in this mini-storage smackdown were issued to APC staff to see how they'd survive in day-to-day use.

The keys were plugged into PCs with varying USB port configurations and operating systems to gauge how practical and compatible they were.

Most keys work natively on Windows Me, 2000 and XP but require drivers for Windows 9x. Many were also compatible with Mac OS, although drivers were needed for Mac OS 9.x and under.

We tested transfer speeds by copying two standard file sets (a 40MB ZIP file and a 60MB collection of 154 files of varying sizes) to and from each key. Each test was run three times and the results were averaged to give a final score.

Eagle-eyed readers will note that the transfer speed for a single file was higher than a set of smaller individual files. The type of files you're likely to be dealing with could also have some bearing on which key you buy.



Mittoni AI 128MB

This tough, compact drive won out for its combination of fast transfer speeds, low price and a great all-round feature set. It hangs from a key ring and can withstand a fair amount of roughness and careless handling. The plastic case is reasonably thick and scratch-proof, yet still manages to stay within about 3mm of the edge of the USB port, so it can fit where other keys might not. It also comes with a 1m USB extension lead.



Unlike other USB keys, the chain is connected to the main body rather than the lid, so you're less likely to lose it. However, the software to create and access a password-protected partition has to be installed on the desktop of every machine you plug it into, rather than running exclusively from inside the drive.

File test	Speed (seconds)
Write speed: 40MB ZIP file	60
Write speed: 60MB mixed files	146
Read speed: 40MB ZIP file	42
Read speed: 60MB mixed files	44
Dimensions (WxH): 18x70x10mm Weight: 17g	

<< Details

Contact Mittoni
Phone (03) 9504 0737
Online www.mittoni.com.au
Price \$154



Rule of thumb

USB memory keys aren't just limited to rudimentary file transfer tasks. Manufacturers continue to find innovative ways of combining various functions into the one device thanks to USB's promiscuous nature. A good example is Creative's modular MuVo, which splits into two parts: a USB memory key, and an MP3 player.

Another clever twist to the formula is Trek's ThumbDrive Touch (pictured) which integrates biometric fingerprint security with flash memory storage. Even smaller than some of the dedicated memory keys reviewed in this Labs Challenge, the stubby body of the ThumbDrive Touch contains a fingerprint scanner which, when used with the supplied software, protects the data from unauthorised users (unless they've also got your thumb in their pocket).



USB memory keys

BAFO USB Flash Drive

The BAFO would better be named "Baffle", because of the puzzling way the security software and key work together.

Out of the box, the 128MB key was divided into two partitions of 1MB and 124MB. Loading the bundled software lets you fence off the larger section for password-protected storage. But use the key in another PC without installing the software and you're restricted to the measly 1MB of space: less than a floppy disk!

The BAFO also has a write-protect switch, a lanyard and 1m USB extension lead. The documentation was very poor, and as for speed, this key was one of the slowest in the field.

File test	Speed (seconds)
Write speed: 40MB ZIP file	79
Write speed: 40MB mixed files	229
Read speed: 40MB ZIP file	44
Read speed: 40MB mixed files	71

Dimensions (WDH): 23.5x7x12mm Weight: 14g

<< Details

Contact Comsol
Phone (02) 9701 8800
Online www.comsol.com.au
Price \$244.20
Verdict ●●●○○

IBM USB 2.0 Memory Key

Although this Windows-only key uses the high-speed USB 2.0 interface, the results were inconsistent. It was faster than the USB 1.1 keys for copying files to the PC, but fifth fastest for writing the mixed file set and second last for the 40MB ZIP file.

This ultra-light and compact drive is the best fitting key for a crowded USB port array. The lid attaches to a leather pouch and neck-chain. A tiny partition program is hosted on the drive and lets you set up a password-protected space from any PC. You can easily resize both partitions. There's also a write-protect switch and a flashing green light that indicates when it's connected and copying data.

File test	Speed (seconds)
Write speed: 40MB ZIP file	66
Write speed: 40MB mixed files	188
Read speed: 40MB ZIP file	32
Read speed: 40MB mixed files	47

Dimensions (WDH): 18x4x4mm Weight: 13g

<< Details

Contact IBM Australia
Phone 1800 289 426
Online www.ibm.com.au
Price \$299
Verdict ●●●●○

FlashDio FM-USB64

FlashDio's lighter-sized USB key borrows from the style gurus at Apple with its funky see-through shell, making it an obvious choice for the Mac fan.

The thin profile means it easily slides atop other USB plugs, such as a mouse, although the width of the casing could prevent it from slipping into deeply-set USB ports. For that reason, the bundled 1m USB extension lead is a sensible and welcome inclusion, and it also means you don't have to fiddle around the rear of the PC.

You also get a neck strap, although we found the connecting post was not very robust. Like many other keys, a handy LED indicates if the device is ready and if data is being transferred.

In speed and pricing the FlashDio sits happily around the middle of the pack.

File test	Speed (seconds)
Write speed: 40MB ZIP file	65
Write speed: 40MB mixed files	195
Read speed: 40MB ZIP file	44
Read speed: 40MB mixed files	72

Dimensions (WDH): 20.7x13mm Weight: 15g

<< Details

Contact Flashmemory.com.au
Phone (03) 9890 5611
Online www.flashmemory.com.au
Price \$215
Verdict ●●●○○

Jungsoft NEXDISK

The NEXDISK 128MB USB memory key is light and small enough to fit in any pocket without inconvenience, or to hang around your neck using the supplied strap. Red and green LEDs let you know not to rip it out while it's still transferring data. The dual tone matte and brushed silver plastic body is thin enough to fit side by side in the tightest USB hubs, and it also comes with an extension lead. A tiny switch at the back will write-protect the drive but it can only be activated using a finger or mangled paper clip. The CD includes formatting and security software, plus drivers for Windows 9x. NEXDISK self-installed easily on our XP machines but is only compatible with Mac OS if you don't activate the password protection. The password software works as a Windows-only EXE file and once you set the password option, you can't go back to having no password.

In all tests, NEXDISK ranked among the slowest drives.

File test	Speed (seconds)
Write speed: 40MB ZIP file	73
Write speed: 40MB mixed files	285
Read speed: 40MB ZIP file	67
Read speed: 40MB mixed files	78

Dimensions (WDH): 20x10x5mm Weight: 16g

<< Details

Contact Bit Distribution
Phone (03) 9888 2005
Online www.bitdistribution.com.au
Price \$199.98
Verdict ●●●○○

Labs Challenge

Leadtek WinFast LR-1710

You can tell at a glance that this unwieldy fish-shape design is way too bulky to fit into a standard port array. Luckily the WinFast comes with a 3.5cm long USB adaptor as well as a 1m extension lead, although it's a pain to carry these all the time.

The silver shell has an extra layer of reasonably drop-proof clear plastic, but this slippery coating also makes the lid hard to remove. There's a detachable elastic wristband on the end of the drive. A rather stiff write-protect switch on the side provides basic security. The WinFast's read speed was middling, and the write speed lacklustre.

MobileDrive 3-in-1

This interesting drive allies a conventional slab of Flash memory (from 32MB to 1GB) with an SD/MMC card reader/writer. You can load an SD card to boost the MobileDrive's capacity beyond its built-in memory, or shuffle files between SD cards from a digital camera, audio player or handheld and your PC. Despite the moulded rubber grips along

the side, the MobileDrive's shell doesn't feel particularly solid.

Security is limited to a hardware write protect switch. Also included is 1m USB extension cable and a lanyard leash.

The versatile MobileDrive 3-in-1 turned in good speeds all around, and you also get the bonus of having an SD card reader on hand.

File test	Speed (seconds)
Write speed: 40MB ZIP file	94
Write speed: 40MB mixed files	261
Read speed: 40MB ZIP file	42
Read speed: 40MB mixed files	67

Dimensions (WxHxL): 37x45x17mm Weight: 21g

<< Details

Contact Rectron
Phone [02] 9748 7725
Online www.rectron.com.au
Price \$118
Verdict ●●●○○

File test	Speed (seconds)
Write speed: 40MB ZIP file	64
Write speed: 40MB mixed files	193
Read speed: 40MB ZIP file	45
Read speed: 40MB mixed files	72

Dimensions (WxHxL): 38.3x85.8x21.2mm Weight: 20g

<< Details

Contact Multie Technology
Phone 1300 369 985
Online www.multimedia.com
Price \$269.95
Verdict ●●●○○

Sony MicroVault

Sony hopes to cash in on its consumer cachet by taking its MicroVault into the mainstream. The slim design with its brushed silver look certainly appeals. And the internals, built by M-Systems (creators of the original DiskOnKey) helped the MicroVault clock the fastest write speed and great read speeds. While there's some flex in the plastic shell, the assembly itself feels solid enough to withstand everyday office rigours, and there's a handy lanyard so the MicroVault can be slung around your neck. The bundled Security Zone software works fine but is a bit confusing, as the disk also includes a "PocketBit Security Application" that seems to do the same thing, although this isn't mentioned anywhere in the manual.

Also missing is a write protection switch and USB extension cable. But the biggest handicap is the outrageous pricing: from \$99 for 16MB to \$299 for 128MB. Consumers who don't know better will love the MicroVault; the rest of us will find better value elsewhere.

Apacer HandyDrive

Apacer is a well-known maker of solid state memory and the HandyDrive is a natural extension of its product line. Due to the bulging design, it can be difficult getting the HandyDrive into cramped USB ports, which makes the supplied extension cable almost a necessity. The HandyDrive supports Windows, Mac and also runs under the Linux 2.4.0 kernel (the manual includes information on configuring it for use with Linux's "USB manager"). There are no security features, but the HandyDrive's performance places it near the top of the pack for writing speed and it fared well for read speeds too, which means it's well worth the \$169 asking price. An optional docking cradle is also available.

File test	Speed (seconds)
Write speed: 40MB ZIP file	54
Write speed: 40MB mixed files	106
Read speed: 40MB ZIP file	42
Read speed: 40MB mixed files	48

Dimensions (WxHxL): 25x11x13mm Weight: 11g

<< Details

Contact Sony Australia
Phone 1300 137 669
Online www.sony.com.au
Price \$299
Verdict ●●●○○

File test	Speed (seconds)
Write speed: 40MB ZIP file	64
Write speed: 40MB mixed files	124
Read speed: 40MB ZIP file	45
Read speed: 40MB mixed files	65

Dimensions (WxHxL): 28x65x15mm Weight: 17g

<< Details

Contact Bluechip Infotech
Phone [02] 8745 8400
Online www.bluechipit.com.au
Price \$169
Verdict ●●●○○

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The write stuff?

APC examines The platform,
The products and The promise of
Microsoft's new Tablet PC.

If you've got a long memory, you'll have seen the Tablet PC before, in one of pen computing's countless incarnations over the last decade. If not, you've still probably glimpsed the Tablet PC at least sometime in the past few months, as Microsoft wound up the volume for a PR and product blitz as only the Redmond colossus knows how.

This isn't Microsoft's first go at pen computing — that stretches back to 1991's Pen Windows and the aborted WinPad project of 1994 — but it's the company's most serious attempt to make good on years of promises and numerous false starts.

And it's not quite what everyone expected.



OK

Cancel

Apply

start

8:13 AM

What it's not . . .

The Tablet PC isn't the next wave of computing that Bill Gates has been touting with evangelical fervor. It's not the PC for people who can't type, or are afraid of the traditional computer, and it's not the device to be carried around the house and onto the back porch as you'd handle a magazine. It's not even going to replace the notebook any time soon.

But nor is the Tablet PC a flop or a dead-end product. It works, and on the whole it works surprisingly well, provided your expectations are grounded in reality.

It's got undeniable potential, and if Microsoft sticks with the Tablet until its habitual "third time lucky" release kicks in — as has previously applied to Windows, Windows NT, Word, Internet Explorer and the PocketPC — then its perseverance and deep pockets might see it succeed where, until now, failure has been written on the wall.

... and what it is

A Tablet PC is much closer to a true notebook PC than a handheld. In fact, most Tablets are built on a notebook platform. This means Tablet PC can make full use of the processing power, graphics and storage available to notebooks today, and that's the strongest card in Microsoft's hand.

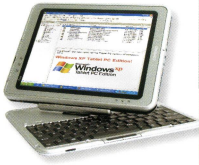
The operating system is fully-fledged Windows XP with added bits to work with pen input, capture "digital ink", perform handwriting recognition and other Tablet-savvy tasks.

Officially christened Windows XP Tablet PC Edition, the OS is a "superset" of Windows XP Professional (with Service Pack 1 applied). Any software or hardware that runs on, or plugs into, Windows XP can be used with a Tablet PC.

Hands-on with the new Tablet PCs

Almost two dozen hardware manufacturers have inked deals to produce Tablet PCs, ranging from a handful of established brands to an array of Asian vendors and even a few newcomers (such as Motion Computing, a start-up founded by several former Dell executives).

APC has had the chance to evaluate the first four Tablet PCs available in the Australian market: models from Acer, Fujitsu, Hewlett-Packard (whose entry, shown right, still carries the Compaq brand) and Toshiba. You can read our reviews starting on page 87.



Convertible and slate

The two main Tablet form factors are the convertible and slate. Convertibles are notebooks where a rotating screen flips around 180 degrees and folds flat over the keyboard — with the display facing up instead of down — to become a pen-driven tablet. They're the safe bet, because they're less strange to the buyer and guarantee at least a workable notebook.

Slates are far sexier: they use the same special display but with all the regular PC technology sitting behind the panel. With no built-in keyboard, a slate device relies entirely on the pen and screen for input. Slates are more appealing to specialist market segments, especially those that rely on collecting forms-based data, but for the time being slates will struggle to gain broad acceptance.

In either guise, the first batch of Tablets are priced around the \$5,000 mark, which puts them at a clear premium against a conventional mid-range notebook. Given that Tablets are closer to an ultraportable in spec notebooks — they employ a sub-1GHz Pentium III Mobile processor and are fitted with a screen no larger than 12.1 inches — this price disparity becomes even more pronounced.

The gain, we're told, is productivity.

Exactly what the Tablet PC's target market is depends on who you talk to. Bill Gates has been particularly bullish, saying that the Tablet was the PC for *everyone*. In his keynote address to last year's Comdex geekfest in Las Vegas, he predicted that the Tablet PC would become the most popular form of PC within five years. Not everyone agrees, of course. Not even some of Gates' own lieutenants consider the Tablet PC is ready for prime time quite yet.

"We have to focus on one particular sector to start with. It's a one point zero product," explains Harry Shum, research manager of Microsoft Research, Asia. "We believe knowledge workers [will be] first to adopt and embrace this product. We understand the importance of home users . . . but at the very beginning we must focus on one particular sector, and that's the knowledge worker."

So Microsoft's first marketing salvo is being directed at corporate users, specifically the breed tagged as "corridor cruisers" — those who tend to spend more time moving around head office (especially to attend meetings) than in their own office, yet still want access to their PC and the network wherever they are.

Alex Loeb, corporate vice-president of Microsoft's Tablet PC project, sees that as a necessary first step on the Tablet's long march into the mainstream, although she's slightly less ambitious than Gates: "I truly believe if you look three- to five-years from now, it will almost be ludicrous to think of a laptop without Tablet PC functionality."

Yet while a score of manufacturers have signed on to the Tablet's dotted line, many analysts appear to be hedging their bets and some PC champions, such as Dell Computers' Michael Dell, remain publicly underwhelmed by the device.

During his own Comdex keynote the day following Gates' presentation, Dell compared the Tablet PC to the legion of failed pen devices which have gone before it. "Go back to the pen phenomenon about 10 years ago. Where were all those customers for the pen PC when it was finally introduced?

"Making a Tablet PC is not very hard, [just] find me customers that want to buy it!"

Tablet Technology

While Microsoft contracted to build several of its own branded Tablets during the product's early development stages, the creation of Tablet PC hardware now rests solely in the hands of the OEMs. The Big M's role is limited to providing the operating system (available only with Tablet PCs, not as a shrink-wrapped box over the counter) and promoting the living daylight out of the category.

But unlike the first generations of Windows-based handhelds, where a strict "reference platform" resulted in a clutch of look-alike devices that were as close as clones to one another, Microsoft has set down relatively few rules for manufacturers to follow.

"We've struggled with this for the last three-and-a-half years" reveals Alex Loeb. "We could have been more prescriptive and the user experience may have been slightly more consistent, or slightly better, but I don't think you would've seen the innovation or variety. I don't think we've ever thought about being looser [with the minimum requirements] — to be honest, we're pretty loose. We really asked ourselves, 'is this absolutely essential for the user experience?' and if the answer was no, it was not a requirement."

screens get the gift

The few requirements Microsoft *did* mandate revolved mostly around the screen, which is the key to the Tablet PC experience. Tablets use an electromagnetic digitiser panel, typically supplied to OEMs by Wacom, a company best known for producing input tablets used by graphic artists.

Most handhelds rely on "passive" screens where two resistive coatings separated by spacer dots determine the stylus input. There's no direct communication between the stylus and digitiser screen.

"Without the kind of quality and sampling rate [of an electromagnetic screen], you had a failed user experience" explains Loeb. "With a resistive screen, there's no way you are going to get ink that looks like that" she says, as she swipes the stylus across the Tablet PC in her hand to demonstrate the sensitivity of the screen and the way the smooth anti-aliased digital ink becomes thicker as you press the pen harder.

The "active" screen in a Tablet PC sees an electromagnetic component inside the stylus interact with the digitiser, allowing you to direct the cursor by simply hovering the pen over the screen without actually making contact. As the digitiser panel, it only accepts input from the electromagnetic pen, you can rest your palm on the screen without it registering as a mouse-click or cursor movement.

Tablets also steer clear of legacy ports such as the serial, parallel and PS2 connectors. Not only are these largely redundant in this USB age, they impose an unnecessary drain on battery life and increase the time needed to boot, suspend, hibernate and resume. The aim is for the Tablet PC to be as close as possible to an "instant on" device.

Within those boundaries, OEMs are reasonably free to interpret what Tablet PC means for themselves and the consumer.

THINK INK

Previous pen computing efforts focused on the ability to quickly and accurately convert natural handwriting into printed text as soon as it was written. It's a lofty goal that still eludes the Tablet PC, which

Windows' new Tablet PC apps

Journal

The centerpiece of Windows XP's Tablet Edition software and the crowning glory for Digital Ink. Resembling a ruled legal pad, it's the natural place to jot your notes, with text-formatting smarts such as a bold and italic, a range of pen thicknesses, colours and highlighters. If you make a mistake, an "eraser" on the Tablet PC stylus rubs out the digital ink.

Inked scribbles in a Journal document can also be converted into text at any time, even long after you've forgotten what you actually wrote.



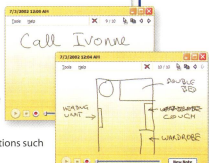
Input panel

Similar to the recognition area on a PocketPC, this is where users can write single words or short phrases and have them immediately translated into plain text and automatically dropped into the Journal (or any pen-supportive application, such as Word). A pop-up "soft keyboard" stands ready for the more frustrating characters and symbols. The Input Panel is also the only entry mechanism for writing Asian languages.



Sticky Notes

These high-tech versions of the famous Post-It Note allow you to make quick ink jottings of notes, things to do, or sketches and diagrams. They can also record voice memos using the microphone built into all Tablet PCs. Stickers can be left sitting on your Tablet desktop or embedded into applications such as Word and Excel.



Tablet and Pen settings

A new Control Panel applet allows you to configure the various aspects of the Tablet PC, such as the action of the pen (what in mouse terms is a double-click becomes a "double tap: "). There's also "southpaw support" which sees pull-down menus fly out to the right rather than the left, so they won't be obscured by a left-hander using the Tablet.

OK Cancel Apply



is why Microsoft is playing down the Tablet's real time recognition. Instead, the company's pen palladins are talking up the joys of Digital Ink. Based on the InkWriter technology of Aha Software, which Microsoft acquired in 1996, Digital Ink is more than capturing an image of bitmapped pen strokes. Handwriting is stored as a data object that can be formatted, and if desired, translated into text. Microsoft believes that most users will be content to write directly in Digital Ink and perform limited ink-to-text conversions.

Its message of "keep it in ink" belies the fact that Microsoft has developed perhaps the most successful handwriting recognition engine to date. Of course, "successful" is a subjective word. Microsoft claims an accuracy rate of 90% by the time the user gets comfortable with the Tablet PC interface. While we found that to be optimistic, if you take a little time and care forming your letters, the strike rate gets

close enough to make it all worthwhile. The handwriting recognition system also runs in the background, which is how inked text can be searched and how the subject line scribbled in a Journal document becomes the file name used by the OS.

The Tablet PC also offers the same speech recognition engine as featured in Office XP, but with Microsoft making very little noise about this, we got the feeling there's little confidence behind the technology. However, what Microsoft and its partners are confident about is the long-term future of the Tablet PC platform. No-one is expecting an overnight hit. But if they're correct, then it will be time to write a new chapter and maybe even a happy ending in the history of pen computing.

Simon Tsang and David Flynn

Tablet PCs Feature

So, where's the software?

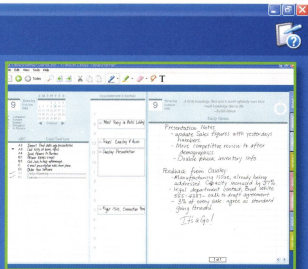
Applications are the driving force behind any platform. And while the Tablet edition of Windows XP runs all current Windows applications (within the limits of Tablet hardware), to get the most out of a Tablet, applications must be made "pen-aware".

Microsoft will tightly integrate pen and ink support to the 2003 revision of its Office suite. You can get some idea of what's in store by examining their free Tablet PC add-on for Office XP. This lets users send a handwritten email using Digital Ink in Outlook (recipients running a conventional PC will receive the message as an embedded image).

A Snippet tool lets you circle a portion of a Web page with the stylus and email it along with its URL so the recipient can get see a preview of the site before clicking on the link. And Word documents can be annotated with handwritten notes, circles and highlights.

Outside of Redmond, digital diary developer Franklin Covey has already released a TabletPlanner edition which supports the Tablet's handwriting recognition APIs.

But the Tablet PC needs more than revamps and retrofits to succeed. It needs a new generation of applications that exploit the



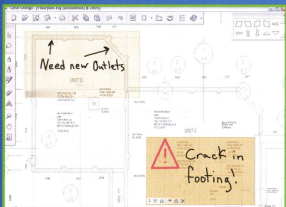
platform's unique capabilities. Corel's Grafigo (aka Graphics on the Go) is the first such program. Essentially a "digital sketchpad", the Grafigo interface has only icons for pen-based navigation. Each file is "borderless" and stretches out like a never-ending piece of butcher's paper that can later be chopped and printed.

Grafigo's shape recognition engine instantly converts handwritten flow charts to formal diagrams without losing scale, line thickness or dashed lines.

Corel has also developed digital tracing paper, called Onionskins, that float on top of the main page and allow you to make notes on drawings and photos without affecting the original file. Onionskins are automatically saved with the file and can be colour-coded for different ideas or users.

Grafigo palettes can be customised for different industries such as architects or engineers, and sketches can be viewed in any Web browser. Check www.corel.com/grafigo (but you'll have to supply your own Tablet PC).

Fiona Angus



View other Tablet PC tutorials:



Input Panel Tutorial



Journal Tutorial



Speech Tutorial



► **Legacy-free:** Tablet PCs favour the likes of FireWire and USB over the older and slower PS2, serial and parallel ports.

of RAM and a 30GB hard drive. It's not a stellar performer, but is on par with most ultra-portables. The weight has been pared down to 1.5kg, compared to 1.8kg for its convertible competitor from Toshiba. 300g makes a noticeable difference in a tablet device, but the Acer is still a little heavy to comfortably hold in one arm for any practical length of time. And while the 10.4in screen is fine for close-up tablet use, it's a little small in notebook mode and the display quality is slightly milky.

In addition to the aforementioned SmartCard slot the TravelMate offers a PC Card slot, a pair of USB 1.1 ports and a single FireWire port. For connectivity there's a 56k mode, 10/100 networking and Wi-Fi. A supplied external CD-ROM drive snaps into the USB ports for loading and storing disk data. Also included is a second battery.

The conversion from notebook to tablet is slightly clunky, involving a series of latches and spring buttons which wasn't as quick or elegant as the Toshiba. Still, a little practice gets it down to an impressive-looking five second routine. But there is a small degree of disconcerting free play in the hinge when the screen is being swung into tablet orientation, and you need to hit a button to change the display orientation between portrait and landscape — unlike the Toshiba, which takes care of this automatically.

It's curious that while Acer sensibly ships two stylus — a standard digitiser pen with barrel-button and a tail-mounted "eraser" for rubbing out digital ink; and a cheaper plastic pointer for emergency use — it's the cheapie that's housed in the display bezel, while the better quality stylus doesn't have anywhere to live.



► **Secure feeling:** the Acer's SmartCard slot will appeal security-minded buyers.

More often than not we left the digitiser sitting on a desk and had to resort to the plastic pointer; allowing a slot for each stylus would have made much more sense.

The keyboard is another oddity: the curved layout is certainly eye-catching but takes quite some getting used to, especially due to the small keys and their short travel. The space bar was particularly soft and overly sensitive.

Acer is determined to make a big splash with the C102Ti; how many buyers are willing to dip their toes into the water remains to be seen.

David Flynn

A friend indeed

Despite a few quirks, Acer's first venture into the Tablet PC market is surprisingly good.

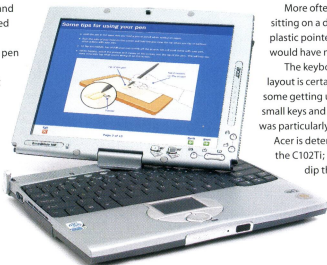
Acer was exceptionally quick off the mark with its TravelMate C102Ti, churning out thousands of solid first-off-the-line models for supply to Microsoft to be used in Tablet PC corporate customer briefings, media workshops and product previews. As a result, the TravelMate has become the defacto poster child of the Tablet PC campaign.

It's a role to which the \$4,499 C102Ti is well suited. Based on an ultraportable notebook, Acer's tablet is more approachable and better conveys the notebook-with-more formula than a slate device like the Fujitsu ST400; at the same time, it's less of a notebook than Toshiba's Portege 3500.

And Acer has the most to gain from jumping first into this nascent market. Unlike Compaq and Toshiba, the company has never been perceived as a major league player in notebooks; and it doesn't have Fujitsu's runs on the board in the pen computing space.

The TravelMate C102Ti is aimed squarely at enterprise customers and entrepreneurial "early adopters". It comes in a leatherette portfolio, is finished in a safe combination of charcoal grey and brushed metal, and includes a SmartCard slot for the security-conscious.

The TravelMate's powerplant is a 800MHz Pentium III-M, backed by 256MB





► **Well connected:** the ST4000 is strong on connectivity with infrared, modem, networking, two USB 1.1 ports and a FireWire port, while Wi-Fi lurks inside.

The plastic pen seemed rather lightweight but was comfortable, evenly balanced and provided good sensitivity with the Wacom digitiser.

Buttons down the right side of the display fascia provide quick launch for Web and email, change the screen orientation between landscape and portrait, and switch the video output to a conventional desktop monitor.

Even the Phoenix BIOS has been built for tablets, as the startup screen (which appears before Windows loads) allows the user to tap the stylus to access BIOS setup, the boot menu or a diagnostic screen.

Unfortunately, there's just not enough muscle under that impressive business suit. The engine is underpowered, and it shows with laggard performance — an ultra low voltage 800MHz Pentium III-M, 248MB RAM and a meagre 20GB hard drive.

And even with this power-efficient CPU, the ST4000 grew uncomfortably warm on the rear side of the display — not something you want in a device that's meant to be held and carried all day.

The ST4000 slate will be bundled with a small footprint cordless keyboard for around \$5,000. Another \$600 will also get you a desktop docking station with cordless mouse. The keyboard foregoes the dedicated numeric keypad to achieve its small footprint, although the keys have a cheap plastic feel and were quite noisy.

On the other hand, the desktop "Tablet Dock" unit is very impressive: a heavy base plus a solid backpane onto which the tablet snaps into place, latches and locks firm. A quick-release mechanism makes it easy to grab and go.

The backpane can rotate from vertical to horizontal, so the tablet can be used in more conventional "widescreen" mode as a desktop; a small arm behind the dock allows the tablet display to be positioned from a deck-chair recline to straight vertical.

The base unit includes a modular bay, which in our sample contained a DVD/CD-RW drive, plus a trio of USB 1.1 ports, a FireWire port and a network port. These add to the tablet's own network and modem jacks, 802.11b Wi-Fi, PC Card slot and two USB 1.1 ports.

David Flynn

Experience counts

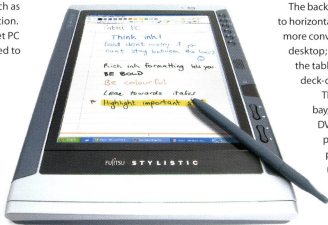
Veteran tablet computer maker, Fujitsu, delivers a solid business-like machine.

Of the first four Tablet PCs to ship in Australia, this is the most polished attempt at a slate form factor, and not without good reason. Long before Microsoft co-opted the word "tablet" to brand its platform, Fujitsu was (and remains) the world's leading manufacturer of tablet computers.

The company supplies a range of pen-based systems to vertical segments, including transportation, utilities, insurance, field sales and health care. To date, these have mainly relied on Windows 98SE or 2000, with CIC's PenX pen extensions bolted onto the OS to provide pen and tablet services such as inking, ink capture and handwriting recognition.

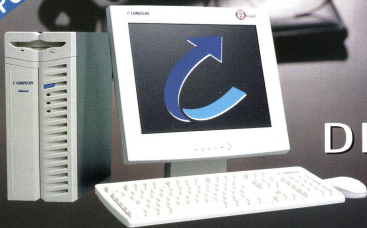
This gives Fujitsu a head start in the Tablet PC stakes, and with the Stylistic ST4000 it's played to its strengths.

Finished in a classic, corporate colour scheme of brushed metal and charcoal blue-grey, the ST4000 has slightly larger dimensions than a sheet of A4 paper, but with 2cm depth, and tipped the scales at 1.5kg. The 10.1in display, driven by an Intel Extreme Graphics controller, was one of the best tablet screens, producing crisp, vibrant images that retained their richness when viewed from most angles.



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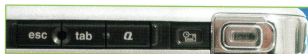
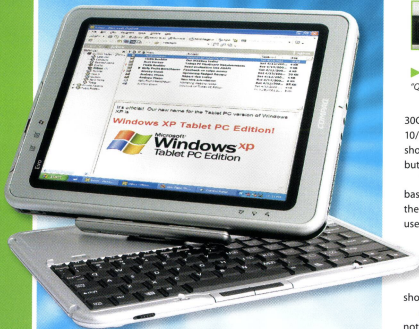
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► On Q: side-mounted keys on the tablet include one-touch buttons for the "Q launcher" menu software and your default email application.

30GB hard drive, 16MB nVidia chip, two USB 2.0 ports, Wi-Fi, 56K modem, 10/100 Ethernet, VGA out, plus PC Card and CompactFlash slots. Several shortcuts are embedded on the face of the screen, keyboard function buttons and a small navigation dial on the side panel.

The TC1000's pen is thicker and heavier than the batteryless signal-based technology used by Acer, Fujitsu and Toshiba. Designed by the A.T Cross Company (better known for building quality pens that use old-fashioned wet ink) it requires an unusual AAAA battery, which needs replacing every six months under daily use. The pen makes a noticeable tapping noise on the screen and you have to press quite firmly when writing (more like you're using a biro than a felt-tip). The screen is strong and scratch-proof, but it tends to show up smudging and reflect overhead lighting.

Although the Compaq functions well as a pure Tablet, as a notebook it's cramped and difficult to use. The thin plastic keyboard base (450g) has a central axis that swivels and flips the screen between Tablet and notebook mode. In notebook mode it's extremely top-heavy and tends to wobble. It also can't close like a regular notebook, as the tablet face is always exposed. On the other hand, the central tilt makes it much easier to use on aeroplane tray tables.

The flimsy, undersized keyboard and base are less robust than the tablet itself. A trackpoint and two narrow right/left keys underneath the spacebar are too cramped to use for any period of time.

The docking station (sold separately) is meant to transform the tablet into a desktop PC. Not only does this require an extra keyboard, but the TC1000's 10.1in screen is extremely small. The swing-arm stretches down so you can lay it flat across the desk for writing, but the dock is only really essential if you need to access

a CD drive (local drive configurations were being considered at the time of writing) or the four extra USB ports, another VGA or Ethernet port.

HP estimates the Tablet will cost around \$5,000 and will sit as a subset of its Evo range of notebooks and ultraportables.

Fiona Angus

Good To go

Radical design makes for an excellent Tablet PC but a less than impressive notebook or pseudo-desktop.

Compaq's TC1000 Tablet PC attempts to be three machines in one: a Tablet, a notebook and a desktop. It's the most ambitious of the new wave of Tablets and reminiscent of the combination notebook/desktops that Compaq showcased in mid-2001 (before merging with Hewlett-Packard).

The centrepiece of the radical three-part system is the detachable Tablet. Although this houses all the main system components, it remains thin (2.2cm), light (1.4kg) and the perfect size (21 x 27cm) to cradle on the forearm.

The key to the compact design is the use of Transmeta's Crusoe 1GHz processor instead of the Intel chips favoured by rival Tablets. Transmeta chips emulate the Intel x86 code using a software layer rather than adding extra transistors to execute instruction sets. While this method is slower than a pure hardware solution (hence, the need for the Crusoe to have a higher clock speed than a conventional processor) it allows the TC1000 to maintain moderate heat levels and run almost silently. Compaq hopes its tablet will deliver up to five hours of battery life from Crusoe's energy efficiency, although as this was a pre-production machine, we were unable to test that claim.

The TC1000's specifications are equivalent to an ultra-portable notebook with 256MB of memory, a



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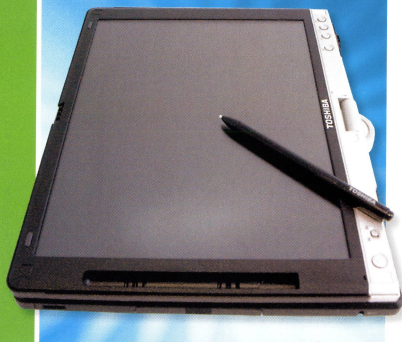
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Pick of The crop

Toshiba has managed to build an excellent notebook that doubles as a great Tablet PC.

While Fujitsu and HP have opted for the slate form factor, Toshiba's Portégé 3500 adopts the "convertible" design to underscore its intention to be a first-rate notebook with the bonus of tablet functionality.

It's a safer route for a market that, in its early days, is likely to be little more than a slice of a subset of a niche, and a more sensible route when you've built your brand and expertise around conventional notebooks.

The Portégé 3500 runs a 1.3GHz Pentium III-M in order to strike a balance between grunt and gas-guzzle. The hardware form factor allows for the assembly line to swap the CPU out for Intel's forthcoming 1.5GHz Banias chip next year as part of the product's second-gen overhaul. Other key specs include a 40GB hard drive and 256MB of RAM.

To keep things cool, Toshiba has enhanced their water-cooling system to include a "remote heat exchanger." A copper heat pipe containing water under vacuum pressure connects the CPU to a radiator. Water evaporates to steam over the CPU, flows to the radiator and there condenses into water, to be carried back to the CPU for another round. At the same time, a fan draws air off the processor and funnels it onto the radiator for additional cooling.

The Portégé 3500 is well connected, ranging from the mandatory Ethernet and 56K modem ports to a pair of USB 2.0 ports, plus single slots for a PC Card, CompactFlash (Type 1) and SD cards. It's the only Tablet with both 802.11b Wi-Fi and Bluetooth wireless



► **Pick a card, any card:** three slots on the left side of the Portégé 3500 accept CompactFlash Type 1, PC Card and SD/MMC cards.

technologies built in, and there's also a hardware switch to disable wireless activity in areas where interference could be a problem.

"Robust" is the only word to describe the design and build quality, from the magnesium casework to the embedded stainless steel swivel with a no-nonsense look which anchors the display panel to the chassis. This gives a solid rotation point and a confident feel when you swing the screen between notebook and tablet modes.

On the downside, it all makes for considerable heft: the Portégé 3500 weighs in at 1.8kg. That's no problem when it's nestled on your legs, just above your lap with your knees up in laid-back mode. But balancing a 1.8kg slab in the crook of your arm while you're trying to scribble notes is something else.

In fact, using a Tablet PC (any Tablet, not just the Portégé 3500) as both nature and Bill Gates intended proves a challenge in most positions. Screen glare is another issue which should not be overlooked. When using a normal notebook the screen faces the user, so there's very little reflected light cast onto the display. But with a Tablet the angle from screen to ceiling is either more like 45 degrees as you hold it, which offers plenty of reflected light in any environment; or it's almost flat on the desktop, which means you'll cop a full glare from overhead fluorescent lights in the office.

You need a great screen to counteract this, and luckily, the Portégé 3500 has just that: the 12.1in display panel (made from a flexible poly-silicon) is brilliantly bright and vivid. The screen automatically flips from landscape to portrait view, and back again, when you move between notebook and Tablet mode.



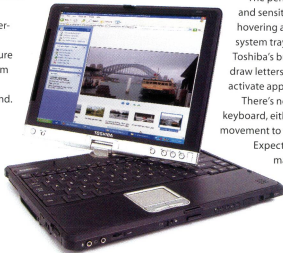
► **Swivel:** this no-nonsense stainless steel hinge is the swivel point for the 12.1in screen.

The pen has excellent responsiveness and sensitivity: almost too much, as merely hovering and holding over icons in the system tray tended to activated them. Toshiba's bundled Sensiva software lets you draw letters and symbols on the screen to activate applications.

There's no compromise with the full-size keyboard, either, which boasted a far superior movement to the Acer.

Expected to sell around the \$5,000 mark, we tip the Portégé 3500 to be the star of the first crop of "convertibles".

David Flynn



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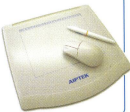
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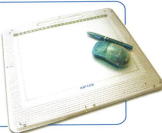
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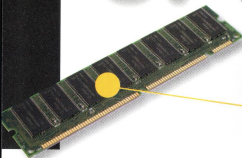
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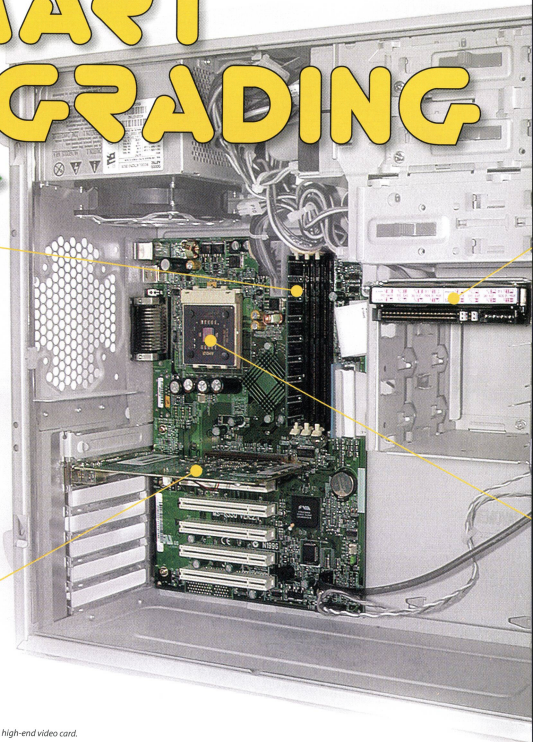
SMART UPGRADING



► It's hard to go past RAM as the cheapest way to give your PC a leg-up. Just don't go overboard with Windows 9x, or load up a motherboard that you might replace (along with SDRAM chips) six months down the track.



► Don't blow your dough on a high-end video card. For a lot of PC upgrades, a budget card like the GeForce 4 MX is the best choice.





▶ No one can argue with a bigger hard drive; just make sure your PC is up to speed in supporting a faster interface such as SATA100.

Give new life to your old box.

Ashley McKinnon tests upgrade options to power up your PC without breaking the bank.



▶ A new CPU and motherboard can produce some surprising swings and roundabouts.

Here are the facts: if your PC is heading towards its third birthday, it's time to move up and buy a new machine. And if your PC is already new or near enough to new, there's probably nothing you need to change or would even want to change.

But if your desktop PC is between one and two years old it's caught in the middle — and so are you. It's doing most jobs well enough that you simply can't justify laying down \$3,000 or more on a new desktop right now (and let's face it, there's no harm in waiting when the PC price-performance ratio just keeps on getting better). But you'd be the first to admit that some extra grunt wouldn't go astray.

The obvious answer is to upgrade. The less obvious question is, which component? Where will you get the best gains for your money, and without simply shifting the current bottlenecks further down the line? How much do you need to spend — or more accurately, how little

can you get away with — for a PC pick-me-up that'll keep your current machine in the game for a good while longer, without going overboard and over budget?

Make no mistake, the art of effective upgrading is a balancing act. So APC set out to find the best, smartest and most cost-effective upgrades which achieve that

balance of price and performance.

We started with a desktop machine around 18 months old (a Gateway Select AS K7-1200) which was still at its factory-standard spec. This was a 1.2GHz AMD Athlon sitting on an MSI 6330 motherboard with 128MB of PCI 133 SDRAM, a 32MB ATI Radeon video card and IBM Travelstar 40GB hard drive. A spec set like that was seriously solid stuff almost two years ago, but is well off the pace today.

We then rounded up a selection of common upgrade components: RAM modules (both SD and PC2100 DDR), video cards, hard drives, motherboards and an Athlon 1800+ processor.

The machine was then configured for dual-boot of Windows 98SE (updated with all patches and DirectX 8.1) and Windows XP (with Service Pack 1 applied), so we could benchmark it under both OSes using Business Winstone 2001, 3DMark 2001 and SiSoft Sandra 2002.

To create a baseline for comparison, we began with a benchmarking session of the system's original configuration. We then started the upgrade, one component at a time, repeating the benchmark run after each upgrade. To ensure a level playing field, we installed the latest drivers for each upgrade component and defragmented the hard drive prior to each test.

How did the various upgrade options stack up? Turn the page to find out...



MO' MEMORY

It's hard to beat a RAM upgrade. Just be sure you know where to stop . . .

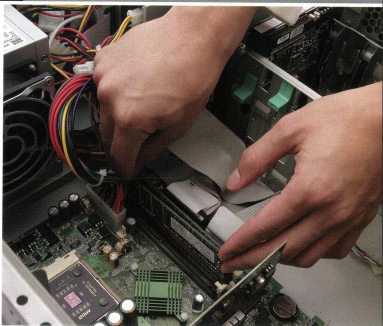
Once upon a time you bought memory based on how much you could afford, but at today's prices it's tempting to simply load up the motherboard with as much RAM as it can handle.

Purely on the "bang per buck" scale, adding memory is undoubtedly the best way to pep up most aging systems — provided your OS can handle it. Remember, the sweet spot for Windows 9x is around 256MB. Beyond that you'll find little performance benefit. Windows XP, on the other hand (like Windows 2000) will make use of as much memory as you throw at it, and return the favour with extra power and stability.

Our test system was fitted with 128MB of SDRAM, which we initially replaced with a single 256MB stick (around \$60). Under Windows 98SE the graphical performance as measured by 3DMark remained almost static — the slight lift from 1,538 to 1,552 came about because the system could process back-end information more quickly.

Business Winstone reported a 22% increase, which is certainly going to be appreciated in everyday applications. Sisoft Sandra file system benchmark showed little improvement with a less than 1% gain. Taking memory up to 512MB with a second 256MB stick resulted in almost no change.

With Windows XP it's a different story, of course. Each benchmark rose as we stepped up to 256MB and then 512MB. In fact, we noticed a performance boost across the whole system once Windows XP was installed. The fact that Windows XP uses the NTFS file system contributes to the gains, as NTFS is more efficient compared to the FAT file system of Windows 98SE.



► Adding more RAM is one of the easiest upgrades you can perform on a PC. Although, any performance increase is largely dependant on the OS you use.

Windows 98SE	3DMark	Winstone	Sandra File System
128MB RAM	1,538	31	14,400
256MB RAM	1,552	32	14,488
512MB RAM	1,554	32	14,489

Windows XP	3DMark	Winstone	Sandra File System
128MB RAM	1,765	33	14,456
256MB RAM	1,805	35	14,497
512MB RAM	1,988	37	14,502



PUMP UP THE PIXELS

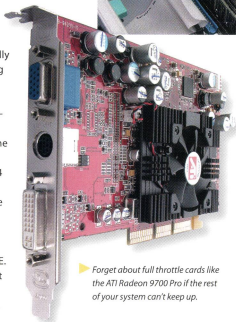
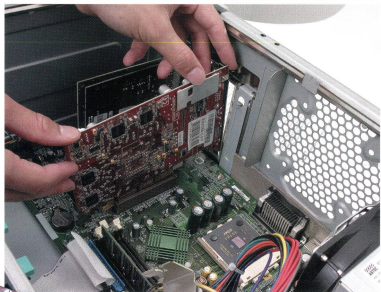
Save your money: mid-range video cards are the best buy.

The test machine's ATI Radeon 32MB video card was the next item on the list. While it achieved respectable benchmark scores, especially under Windows XP, you'd be hard pressed getting smooth playback at higher resolutions.

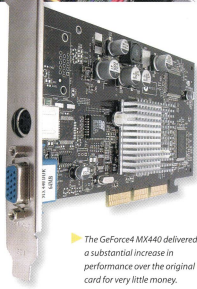
Replacing the card isn't essential, but we were keen to see just how much of a system pickup we'd get by swapping it for a more modern graphics card, and what type of card would be the smartest upgrade.

The first card we fitted was an Eagle GeForce4 MX440 with 64MB of SDRAM (\$135). We installed the latest nVidia Detonator drivers and made sure DirectX was running version 8.1. Performance skyrocketed by some 227% in 3DMark, and this was with the test machine ratcheted back to its original spec of 128MB of RAM and Windows 98SE.

Taking it up to 256MB didn't have much effect on the 3DMark scores, and performance actually decreased with 512MB of RAM. So, for a Windows



▶ Forget about full throttle cards like the ATI Radeon 9700 Pro if the rest of your system can't keep up.



▶ The GeForce4 MX440 delivered a substantial increase in performance over the original card for very little money.

ATI Radeon/32	3DMark (Windows 98SE)	3DMark (Windows XP)
128MB RAM	1,538	1,765
256MB RAM	1,552	1,805
512MB RAM	1,554	1,988

Eagle GeForce 4 MX440/64	3DMark (Windows 98SE)	3DMark (Windows XP)
128MB RAM	3,499	3,650
256MB RAM	3,677	3,908
512MB RAM	3,586	4,213

ATI Radeon 9700 Pro/128	3DMark (Windows 98SE)	3DMark (Windows XP)
128MB RAM	4,156	6,709
256MB RAM	4,462	7,280
512MB RAM	4,460	7,800

98SE desktop of this vintage, the best combo would be to add an extra 128MB (for a total of 256MB) for day-to-day applications, plus an MX440 video card to give your graphics a shot in the arm.

Under Windows XP, as expected, the MX440 card's performance increased in step with the amount of memory.

We also tried a high-end video card, ATI's new Radeon 9700 Pro with 128MB of DDR RAM (around \$995). However, even under Windows XP there was no way the card could reach its potential. This sort of technology is simply overkill for a 1.2GHz CPU, which gets bogged down just trying to service the video card's output.



Feature

ENGINE OVERHAUL

A new CPU and motherboard can produce some surprising swings and roundabouts.

The powerplant was another obvious target, and as the original MSI 6330 motherboard was capped at a 1.2GHz Athlon, we needed to replace it as well.

On the processor side we opted for an Athlon XP 1800+ (\$179), and partnered it with two ASUS motherboards, the A7N266-VM (\$179) and A7V8X (\$359), representing the lower and higher ends of the performance scales.

First to be fitted was the A7N266-VM motherboard, populated with PC2100 DDR memory (about \$145 per 256MB stick). Under Windows 98SE the Athlon 1800+ showed a more than 20% gain in Winstone over the factory-fitted 1.2GHz Athlon; and once again, Windows XP lifted this even further.

Graphics performance on the other hand, is another story. The A7N266-VM's onboard nVidia 220D GeForce video controller (with 32MB of 266MHz DDR RAM) couldn't match the grunt of the original 32MB ATI Radeon card under Windows 98SE and XP. Coupled with the faster memory, performance soared some 140%.

After disabling the onboard video adaptor, we installed the Eagle GeForce4 MX440 card and re-tested. This was a winning move — the GeForce4 MX440 card produced solid results under Windows 98SE and XP. Coupled with the faster memory, performance soared some 140%.

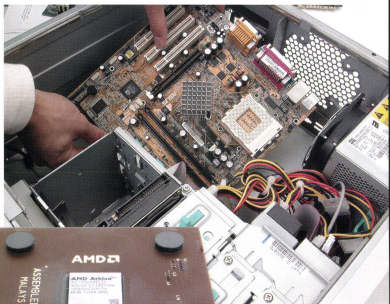
The Radeon 9700 Pro also appreciated the faster RAM and produced some scorching 3DMark results.

File system transfer speeds also climbed because the original A7N266-VM supports ATA100/133 interfaces, while the MSI 6330 motherboard supported only the slower ATA66 interface, capping the IBM Travelstar 40GB hard drive at a maximum 66% of its performance potential.

Waiting in the wings was the ASUS A7V8X motherboard.

With support for DDR400 RAM, Serial ATA, onboard RAID and an 8x AGP slot, this is built for speed. As seen from the scores, the extra money you spend on this motherboard quickly pays

off, especially with 8x AGP letting the Radeon 9700 Pro stretch its wings.



► While a mobo and CPU transplant can be the most expensive part of your upgrade, it can also yield the best results.

ASUS A7N266-VM

nVidia 220D GeForce/32	3DMark (98SE/XP)	Winstone (98SE/XP)	Sandra File System (98SE/XP)
256MB RAM	995 / 1140	39.4 / 47	19,960 / 20,090
512MB RAM	997 / 1538	44.6 / 50.5	19,987 / 20,370

ASUS A7N266-VM

GeForce4 MX440/64	3DMark (Windows 98SE)	3DMark (Windows XP)
256MB RAM	4,960	5,445
512MB RAM	5,300	6,125

ASUS A7N266-VM

ATI Radeon 9700 Pro/128	3DMark (Windows 98SE)	3DMark (Windows XP)
256MB RAM	8,299	8,925
512MB RAM	8,723	9,450

ASUS A7V8X

GeForce 4 MX440/64	3DMark (98SE/XP)	Winstone (98SE/XP)
256MB RAM	5,120/5,895	41/48.2
512MB RAM	5,850/6,283	45/51.9

ASUS A7V8X

Radeon 9700 Pro/128	3DMark (98SE/XP)	Winstone (98SE/XP)
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Feature

FATTER, BUT FASTER?

Adding a new hard drive delivers more space but not always more speed.

There wasn't much wrong with the test system's standard 40GB hard drive, apart from a mismatch with the MSI 6330 motherboard's ATA66 interface. We replaced the IBM disk with an ATA100 Seagate Barracuda 120GB (about \$430) and an ATA133 Maxtor Viper 80GB (\$215). Each drive raised the roof a notch.

But take note: attaching any of today's ATA100 or even ATA133 drives to an ATA66 motherboard is a fruitless exercise unless you also spring for an ATA100-compliant PCI card to run the new drives at their correct speed.

Swapping out the MSI 6330 for the ASUS A7N266-VM made a huge difference, with immediate benefits in access time and application running speeds. However, despite the higher scores posted by the Maxtor, the difference between it and the ATA100 Seagate drive were, in a practical sense, barely noticeable.

MSI 6330 (ATA66)	Sandra File System Benchmark (98SE/XP)
IBM Travelstar 40GB	14,400/14,456
Maxtor 80GB	16,589/16,884
Seagate Barracuda 120GB	16,367/16,765

ASUS A7N266-VM (ATA100/133)	Sandra File System Benchmark (98SE/XP)
IBM Travelstar 40GB (ATA100)	19,960/20,090
Maxtor 80GB (ATA133)	23,940/24,765
Seagate Barracuda 120GB (ATA100)	20,105/20,773

▶ A new hard disk offers more storage and better performance, provided you're careful to match it with the right controller.

SMASHING THE BOTTLENECKS

On a system like our test machine, several subsystems will actually hold back newer components from working at their full potential. Beefing up one element will only take you so far before you come up against shortcomings in another part of the machine.

The hard drive is a case in point. 18 months ago ATA66 was the norm, and ATA100 drives were just starting to appear. ATA66 was fast enough because files were generally smaller (there was much less digital video floating around, for instance) and applications were far less resource-intensive.

But today, huge files and masses of data are the norm, so installing a faster and larger hard drive would seem logical enough. And as our test machine showed, the motherboard might then need to be replaced to enable the drive to run at top speed.

Yet updating the interface alone may not be enough. Tied closely to hard drive performance is the CPU speed and amount of memory. For example, extra memory means that although the Windows paging file will take up a larger chunk of your hard drive, it won't be accessed as much — so performance should be better.

Another synergistic effect can come from installing a new video card, as this will be capable of handling a far larger slice of the graphics workload, which frees the CPU for other tasks.



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THE ART OF UPGRADING

Follow these guidelines for hassle-free hardware upgrading.

If this is the first time you've ever attempted an upgrade, don't be too nervous about damaging your computer. It's quite hard to mess up hardware by installing it incorrectly. You might stop a computer from working by plugging cables in backwards, for instance, but you won't blow anything up.

There are, however, a few basic rules to follow, and even old hands at the upgrade game can benefit from a quick refamiliarisation with them.

DON'T OVERTIGHTEN

You're building a computer, not a bridge. If you tighten all the screws until they beg for mercy you're likely to strip the hole, rip the head clean off the screw (computer screws are often poor quality), overstress an expansion card by twisting its tab, or crack the motherboard. Just screw them down tight enough so they can't be undone with your fingers.

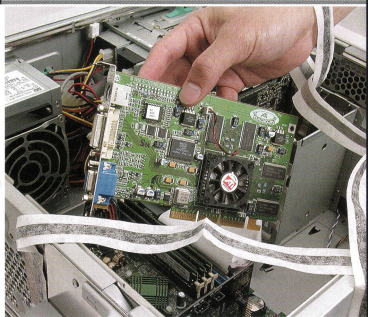
Electric screwdrivers are great if you have to drive in a lot of big screws. When building a computer you only have to drive in a few little ones, so you won't get the job done much faster by using a power driver. Even if your screwdriver has a torque control, it's quite possible you'll overtighten some screws.

Electric screwdrivers also tend to be big and clunky, which makes it hard to use them for fiddly jobs like tightening motherboard screws next to case metalwork.

ANTI-STATIC PRECAUTIONS

It's possible to damage some computer hardware just by touching it. Static electricity, which you pick up and distribute pretty much every time you move or touch something, can destroy the more sensitive electronics in various computer components.

The crackling you get when you stroke a cat on a dry day is thousands and thousands of volts of static, but as little as 200V is enough to fry components. You won't feel a 200V



discharge at all. Realistically, it's unlikely that you'll destroy components with static electricity. You're much more likely to drop them, or overtighten something, or bend connector pins. So don't be too concerned.

To remove the risk of static damage completely, though, you can buy anti-static wrist or ankle straps for less than \$20. A wire leads from the strap to a reference earth — generally the frame of the computer — which must be plugged into the wall, but shouldn't be turned on. True paranoids also use anti-static work mats to lay all the components on; an old newspaper is good enough for most of us.

However, you don't need to buy geek jewellery in order to be static-safe. If you have carpet, especially wool or synthetic, try to find an uncarpeted place to work. Plug the case in as recommended above, and just touch any piece of exposed metalwork periodically while working.

FINGERPRINTS

Handle expansion cards by their edges, and avoid putting fingerprints on the connector. This isn't because your fingerprints are likely to cause corrosion. Edge connectors are gold-plated over a copper or bronze base. Slot connectors have similar plating — usually gold over nickel. Neither is likely to corrode from the acid on your hands.

Oil from fingerprints can, however, attract dust. The gentle breeze blowing through most computers — courtesy of the cooling fans — generally brings with it quite a bit of dust, which can accumulate and become surprisingly thick.

Dust can collect moisture, and moisture plus dust can stuff up the card connection by creating relatively low-resistance electrical connections where there should be none.

MAGNETIC FIELDS

One of the basic tips in every computers-for-idiots guide is to keep your floppy disks and other magnetic media away from magnetic fields, lest your data be wiped. Magnetic fields can, indeed, eat data, but the usual suspects aren't generally the problem.

Every ordinary cone-type speaker driver has a large permanent magnet on its back to give its electromagnetic voice coil something to push against. "Shielded" speakers neutralise the magnetic field with another opposed magnet which is glued to the voice coil one.

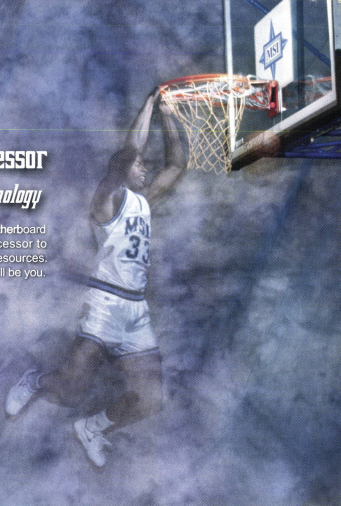


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Feature

An unshielded speaker's magnetic field is clearly apparent if you put it too close to your monitor — the image will distort and change colour. But putting a floppy disk on top of an unshielded speaker probably won't hurt the data on it at all: it's the change in magnetic field strength, more than the actual peak strength, that erases disks.

When you move a disk next to a magnetic object and then away again, the field strength across the disk changes, but it only does it once. A rapidly oscillating magnetic field is much more dangerous than the static one from a simple permanent magnet.

For example, an old-fashioned bell-ringing telephone contains a pulsing electro-magnet that moves the bell clapper. If a disk is leant up against it, it is likely to be rendered useless pretty quickly. The degauss circuit in monitors will zap disks which are left on top of

the monitor, too. And some printers, especially older dot-matrix models, contain quite large motors which are poorly shielded against magnetic fields. Essentially, any electronic device with moving parts may be able to zap your floppies, tapes and Zip disks.

Since magnetic field strength decreases with the cube of the distance, objects such as hard drives don't need to be far away from even strong oscillating fields to be perfectly safe from harm.

Realistically, it isn't likely that you'd leave a new hard drive sitting on top of some perfect erasing device long enough for it to be erased — but it's not impossible. If you've got a spare drive waiting for a home, don't leave it on top of your old dot matrix. [EITB](#)



WINDOWS XP ACTIVATION: UPGRADEERS BEWARE

It's one of the hidden "gotchas" of upgrading. You've done your research, bought the right components to hit that balance of price and performance, and in the middle of your upgrading session, your copy of Windows XP decides it's somehow been transplanted onto a new PC. The Activation Wizard kicks in and wants you to "activate" your copy of Windows XP — now!

We experienced this several times while writing this feature. So what's the deal? The Windows Product Activation (WPA) system ties the 25-character Product Key of your Windows XP CD to a snapshot of your system, based on 10 pieces of hardware which bear unique serial numbers — including the processor, video card, hard drive, IDE and SCSI adaptors — as well as checking the amount of memory.

The snapshot creates a code which in turn is combined with the XP Product Key to produce a 50-digit installation ID that is exclusive to your system. All of the data is stored in WPA.DBL file, located in the \windows\system32 directory.

When you change any of the 10 components identified in the hardware sweep, Windows checks the new configuration against the original snapshot. WPA makes some allowance for upgrades: if your desktop PC has a network card, you can change five of the key hardware components without activation kicking in. If there's no network card fitted you'll be allowed two component upgrades before activation.

Step beyond those limits, and things get messy. As part of Microsoft's anti-piracy measures, Windows XP will automatically delete the WPA.DBL file and ask you to re-enter the registration code and re-activate your copy of XP (either online, or by calling Microsoft's product activation centre).

Once XP is re-activated, the fresh-baked WPA.DBL file will contain an updated hardware profile which is good for another two component changes. WPA automatically refreshes itself

with a system scan every 120 days, at which time your current system becomes the new base installation — this stops previous one-off component upgrades from accumulating until WPA gets narky.

Note that adding new components doesn't sound the alarm bell — only replacing an existing item. And changing the same component several times (for example, going from 128MB to 256MB to 512MB of memory) counts only as a single change, no matter how often you do it.

Notebook users enjoy a little more flexibility (between six and eight component upgrades) because the notebook's hardware setup changes depending on whether it's docked or undocked. For example, when the hardware profile on Windows XP (found in the System Properties dialog box, on the Hardware tab) is set to notebook, WPA ignores any changes to the video card and IDE/SCSI devices.

Ever curious, we told Windows XP that our desktop was actually a notebook, and even after changing five components we didn't see any sign of the activation screen. You can try this trick yourself by opening System Properties, choosing the Hardware tab, and under the Hardware Profiles option clicking the Properties button. Check the option marked This is a portable computer and leave the docking state as Unknown.

If you're wondering what would happen if you set the WPA.DBL file as read only, in an attempt to block Windows XP from deleting it when the third component was replaced — well, so did we.

The result was a serious system crash and upon reboot, Windows' SYSTEM.DAT file was corrupt — which basically meant the entire system registry was dead. The only way out of that mess was a complete reinstall of Windows XP, and that's never been our favourite way to spend an afternoon...
Ashley McKinnon and Serdar Yegulalp

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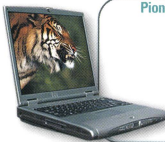
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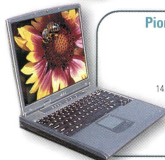
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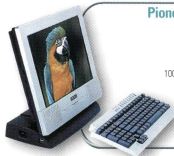
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- Suitable for DWL-1500 and DWL-1000AP+

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AirPro



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- IEEE 802.11a (5GHz) and IEEE 802.11b (2.4 GHz) Standard
- 72 Mbps Turbo Mode IEEE 802.11a
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



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DWL-AB650

11/54Mbps Dualband Wireless PCMCIA Adapter

- IEEE 802.11a (5GHz) and IEEE 802.11b (2.4 GHz) Standard
- 72 Mbps Turbo Mode IEEE 802.11a
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



\$1,015

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DWL-6000AP

11/22/54Mbps Dualband Wireless Access Point

- Compliant with IEEE 802.11a (5GHz) and IEEE 802.11b (2.4 GHz) Standard
- 10/100Mbps Fast Ethernet port for connecting to Wired Network
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152/256 Bit WEP Security

Wireless IP Routers



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DI-614+

Cable/DSL Router with 4-port Switch

- 11Mbps Wireless
- 3-Port 10/100Mbps Switch and 1-Port Print Server
- 10Mbps WAN Port for DSL/Cable Modem
- RS232 Serial Port for Analog Modem
- NAT for single IP Address and Firewall Protection
- DHCP, VPN, PPP, PAP/CHAP Security

Others



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DCS-1000W

Wireless LAN Internet Security Camera

- 11Mbps Wireless
- Built in Web Server for GUI remote access
- I/O Ports to trigger events and Email Notification
- IPView for Image Capture/Video Recording
- Res: 160x120, 320x240 or 640x480
- Frame Rate: 1, 5, 7, 15, 20 or Auto (depends on video Format)



\$590

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DI-713P

IP Router for DSL/Cable modem with Switch & Print Server

- 11Mbps Wireless
- 3-Port 10/100Mbps Switch and 1-Port Print Server
- 10Mbps WAN Port for DSL/Cable Modem
- RS232 Serial Port for Analog Modem
- NAT for single IP Address and Firewall Protection
- DHCP, VPN, PPP, PAP/CHAP Security



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Bluetooth USB Adapter

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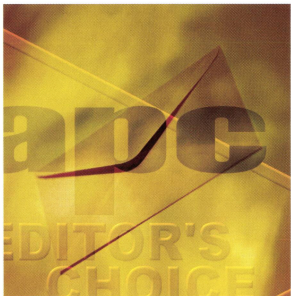
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Tech slowdown? What tech slowdown? At the end of what's been amazing 12 months, APC rounds up the choice gear of the year in eight key categories, and also highlights some of the biggest disappointments.

Best desktop PCs

Australia IT M2 and Australia IT T5

Last month's blow-out PC megatest made it easy to spot the best desktop machines across the field, from a low \$1,200 to a hefty \$7,600. When we sat down to cull the finalists into two broad categories — sub-\$2,500 and sub-\$5,000 — Australia IT (www.australiait.com.au) scored the quinella.

For \$2,499, the Australia IT M2 (shown below, left) is a well-appointed mix of price and performance, with soaring benchmarks across the board courtesy of an Athlon XP2200+ processor, 512MB of PC2700 DDR RAM and a 128MB GeForce4 card.

Boost your budget to \$4,999 and Australia IT's T5 (below) has it in spades: from the slick and roomy tower case to a fire-breathing 2.8GHz Pentium 4, 128MB ATI Radeon 9700 Pro-based graphics card and RAID-paired 80GB WD drives. We'll admit you could do better than the 15in LCD monitor, but at that price there's still some wiggle-room left to step up to a 19in CRT screen.

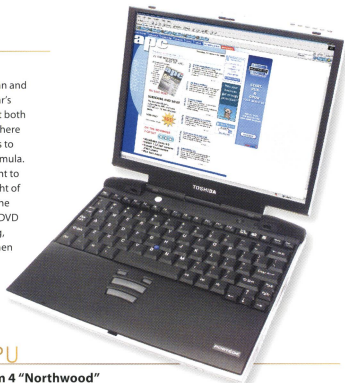


Awards 2002

Best notebook

Toshiba Portégé 4010

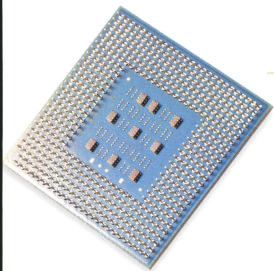
With form factors spanning from muscle-bound desktop slayers to lean and lightweight ultraportables, giving the nod to one notebook as the year's best will always entail a degree of subjectivity. There are champions at both ends of the scale but we found a clear winner in the middle ground, where buyers seek to balance every element, from performance and features to weight and battery life. With the Portégé 4010, Toshiba nailed that formula. The choice of Intel's 933MHz Pentium III-M powerplant has ample grunt to get the job done for almost four hours at a stretch, while the 2kg weight of this tough little magnesium-shelled notebook ensures it won't be at the expense of portability or your spinal column. With a 30GB hard drive, DVD drive, built-in Wi-Fi plus FireWire and USB ports, and a \$4,730 price tag, the Portégé 4010 proves why notebook sales keep edging up even when desktop sales remain stagnant.



Best CPU

Intel Pentium 4 "Northwood"

This time last year Intel had just passed the 2GHz mark; now the silicon supremo has hit 3GHz, and it's still full steam ahead. Yet the chip which made the most impact on the PC platform in 2002 was Intel's Pentium 4 "Northwood" family. This first 0.13 micron Pentium 4 debuted at a top speed of 2.53GHz and remains the foundation of the Pentium 4 family to date. Northwood also introduced the 533MHz front-side bus (a substantial boost from the previous 400MHz) and spurred the introduction of USB 2.0 onto the motherboard of the average desktop PC through its partnership with mobos based on the 845E chipset and ICH4 "south bridge". This time next year the finalists will likely range from Intel's mighty mobile Banias chip with its whopping 1MB cache to AMD's Opteron 64-bit "bridge" chip, and whatever variants of the now-Hyperthreaded Pentiums that Intel wheels out. It looks like being a competitive 12 months.



Best operating system

Mandrake Linux 9.0

Last year's APC Technology Awards saw Windows XP chosen as best software and best overall product: controversial decisions to be sure, but then and now, Windows XP stood out as the single biggest step forward for the PC platform in 2001.

But when it came to casting for the best OS of 2002, so much had changed. Microsoft's Tablet PC extensions to Windows XP just don't fall into the same league. And while Apple's Mac OS 10.2 "Jaguar" is a purrfectly wonderful point-update, that's as far as that cat goes.

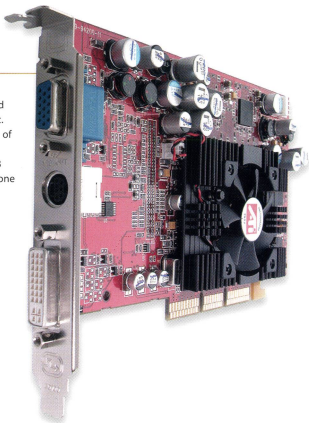
In OS terms, 2002 was the year of Linux: specifically, it was the year which new versions of two established distros (Red Hat and Mandrake) and several promising newcomers (Lindows 2.0, Lycoris Desktop/LX and OEOne) stepped into the spotlight. We've tried them all, and the Penguin that took the prize was Mandrake 9.0.



Best GPU

ATI Radeon 9700 Pro

To the surprise and delight of gamers, ATI went from a fresh-faced newbie to a fragmaster this year with its Radeon 9700 Pro chipset. Putting aside the fancy features and expensive bells and whistles of the Matrox Parhelia, ATI's recipe was raw speed, and plenty of it. It wowed the E3 crowds when id Software demonstrated Doom 3 on a beta of Radeon silicon, and unseated nVidia from the 3D throne once the rash of early instabilities was settled by driver and BIOS updates.



Best handheld

Palm Tungsten T and Toshiba PocketPC e330

We didn't want to split the winning ticket, but we think you'll agree that each of these products deserves line honours. The Tungsten T (\$1,099, see full review on page 44 this month) is Palm's most promising offering for years, and exactly what the former handheld king needs to put the wind back into its sails. The hardware is well designed, and it leverages the pairing of the 144MHz ARM processor and Palm OS 5.0 operating system with excellent communications integration via the built-in Bluetooth chip.

And as our first PocketPC winner, the Toshiba e330 shows how Microsoft's platform has come of age. Toshiba's wallet-friendly models have formerly lost out due to their low spec set, but this mid-life revision now packs a 300MHz XScale processor with 64MB of RAM, which for \$899 edges out the rest of the PocketPC set.

Best digital camera

Canon PowerShot G2

This is the second year running that the PowerShot G2 has walked away with the Best digital camera award. In a bustling field, where resolution kept rising as RRP kept falling, Canon rode the wave with one clear winner a second snapper that's too good not to mention. That it continues to keep its competition at bay is testament to the strength of the G2's unbeatable combination of performance, features, ease of use and value.

We awarded five out of five to the 4 megapixel PowerShot G2 in our December 2001 issue and the passage of 12 months has just made it more of a bargain: from \$1,999 down to \$1,699 for what remains the best digital camera for the "prosumer".

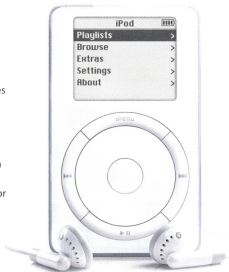
Canon's Digital IXUS V2, meanwhile, is now perched perfectly in the 2 megapixel mid-range. It was a brilliant camera when we tested it in August, but the \$1,099 price edged it off the podium; now that the price has been revised to \$799 (to make way for the \$999 3.2 megapixel V3) it's centre stage stuff.



Best digital music player

Apple iPod

APC magazine giving the nod to a piece of kit from Apple? Yes, when it's as superb a product as the iPod, which now works like a treat with Windows as well as its native Mac platform. Nothing we've seen comes close to Apple's elegant pocket-size music machine, especially now that the base 5GB model has dropped to \$645, Apple's "official" Windows iPod works smoothly with the included MusicMatch Jukebox software, although it's no iTunes. For added Windows-friendliness, APC recommends you also grab XPlay (from www.mediafour.com).



Yawns of the year

USB 2.0

It's bad enough that USB 2.0 seems unable to hit anywhere near the 480Mbit/s speed that the vendors keep blindly promising. Worse still is the USB consortium's effort to rebrand USB 1.1 as "Full Speed USB" while promoting USB 2.0 as "Hi-Speed USB". How can high speed be faster than full speed? This slick marketing-speak manoeuvre squats somewhere between downright confusing and blatantly misleading.

IOMEGA ZIP 750

We like the Zip drive. Really, we do. Everyone at APC relied upon Zip disks for years, until everything from flash memory keys to affordable CD burners reshaped the portable storage landscape. But we've said it before and we'll say it again: the 750MB Zip drive is just two years too late, and you have to wonder if Zip has had its day.

UPGRADES THAT REALLY AREN'T

Attention all software vendors: you want to release a new version of your cash cow? Fair enough, just give us enough features or benefits to excite us and make it worth upgrading. While programs like Norton System Works 2003 and Partition Magic 8, for example, are decent programs in their own right, we're hard pressed to consider either harbour such improvements that they warrant a "New version!" sticker and a \$100+ upgrade price.

LICENSING 6.0

Okay, this was more a gasp than a yawn. In fact it was several gasps. IT managers gasped at the hole Microsoft's three-year "upgrade assurance" scheme would blow in their budget. The Big M's competitors, especially WordPerfect and the Linux crowd, gasped at Microsoft's extraordinary "own goal", but quickly recovered to stitch up deals with everyone from box-builders to businesses and governments. And Microsoft gasped when their customers just didn't understand the extraordinary "benefits" of the scheme, especially the attitudes of the home users who refused to flock to the now-cancelled "software rental" trials.

DRM machine

Will Digital Rights Management bring a new world of secure online entertainment, or will it install the thought police in your PC? Justin Kranz reports.

There's always an abundance of plots in the technology graveyard. Plots being dug, and plots being filled. The thorny issue of distribution of copyright media online has caused its fair share of both. And alongside the graves of Napster, rich-media content dot coms and the stillborn DivX player, is a new addition. It's been a long while coming, but the writing is on the tombstone for unfettered access to online media... the DRM age has arrived.

DRM, or Digital Rights Management, is not merely a new way of saying "copyright protection for digital media". It goes far beyond that. Software and hardware manufacturers have expanded DRM's scope beyond the preservation of intellectual property.

DRM is being hailed as the golden path to a utopian digital age. An era of "trustworthy computing" beckons, where privacy is king, and your system's secrets are protected by a praetorian guard of integrated hardware and software security. Protected that is, as long as you abide by the benevolent dictatorship imposed by your own PC.

A RESTRICTED FUTURE?

DRM is no longer just an exercise in protection of intellectual property. It's now an agenda that intertwines both PC and the Internet. If players like Microsoft, Intel, AMD and Co. have their way, execution of DRM technology will be as fundamental to operating a modern PC as being connected to the Internet. When the world's biggest software company joins forces with the leading CPU providers, the effects are bound to be felt the world over.

DRM support via software is nothing new. Online games in particular make use of rudimentary DRM measures, giving buyers a multiple digit CD "key". When playing online, the player's PC first briefly communicates with an authentication server. If the authentication server gives the thumbs up, the game then proceeds to connect to the actual game server. If the online identifier (the CD key) is already in use or has been linked to abusive practices, use of the gaming service is made unavailable. Similar schemes exist for online registration of software applications. The more sophisticated the software application, the more complex and sophisticated the technology protecting it.

But consumers are used to hearing a litany of stories about latest software copyright protection schemes. However, it's DRM support in current generation hardware that's real harbinger of change. Once the protection and monitoring becomes a part of the very hardware, the state of play changes dramatically. You can always avoid software applications that use such technology. But when it forms part of the system's physical architecture, your alternatives grow scant. For the first time in recent memory, a technology with aims that include potential restriction of use seems to be gathering momentum as a defacto standard.





HARDWARE-SUPPORTED DRM

With Palladium introducing the concept of media rights chips on motherboards, component manufacturers have quickly taken to the advent of hardware DRM enforcement. Creative Labs' current drivers for both Soundblaster Live! and Audigy models will shut down digital output of protected music files if they are deemed to be played on a non-authorized system by a user.

The method by which this is possible is dubbed "Secure Audio Path". Marketed by Redmond as a protection measure for your system (preventing "attacks that seek to replace device drivers"), Secure Audio Path-compliant hardware only processes data that has been given the green light by "a certified Microsoft component".

Microsoft's DRM FAQ (www.microsoft.com/windows/windowsmedia/WM7/DRM/FAQ.asp) demonstrates that Creative is in good company. Audio chipsets from VIA, Yamaha, Ensonique and Aureal all have driver support for the technology. Combined with software that supports such measures, the vision of the material on your PC not always being fully under your control looms ever closer.

And it's just not PC components that are onboard — increasing numbers of portable music players, digital sound processors, even the humble Xbox console, share this capability.

Also, Sony's ATRAC media checkout system for its portable devices still lingers. Even Intel, part of the Trusted Computing Platform Alliance (TCPA) steering the likes of Palladium through the rocky shoals of public opinion, has been hurrying up with its own solutions. "LaGrande" is a wider Intel concept that will most readily find application in the likes of Palladium.

Scheduled to debut in Intel's Prescott generation of chips, LaGrande works by protecting critical hard drive and system data. When operational (the default setting will be for the protection to be disabled), non-authenticated input to devices or the protecting areas of the hard drive are disallowed by the system.

Intel's TCPA team-mate and market competitor, AMD, will also be rolling out processors that comply with the schema. The CPU giant has downplayed its involvement, reinforcing that on AMD-powered machines, the functionality is strictly "opt-in".

Not everyone is fazed by the concept of DRM at a CPU level. "We're the guys that create technology," commented one observer on slashdot.org. "They can lock everybody but us. If new soundcards only play their stuff, on their crippled systems, then we'll build our own systems and soundcards." Optimistic sentiments, but in the absence of a reversal of policy by Intel or AMD, DRM's introduction at a kernel level is a fait accompli. Sooner or later, PCs get upgraded or replaced. And when the two main CPU players in town are part of the standards committee, if you wish or need to stay on a Windows platform, your choices have been made for you.

HOW IT WORKS: THE MICROSOFT WAY

A lot of money and effort is being spent convincing business and home users to regard Windows and DRM as going hand-in-hand. Microsoft has been steadily increasing the media rights management capabilities of its products — both at the heart of the OS and in its utilities.

If you're a provider of content that can take digital form, Microsoft is pushing its Windows Media Rights Manager system. There are no licensing fees attached to the use of the Windows Media SDKs — the foundation of Windows rights management technology, for now, anyway. It works like this:

Step 1 The Windows Media Rights Manager software "packages" your digital work. The work is encrypted and the encryption "key" made part of your licence. The licence is also encrypted, and is distributed separately to your media work. This is important because, in theory, it means the

XMCL has some heavy hitters behind it. Adobe, MGM, Sony Pictures Digital Entertainment and Sun Microsystems have all thrown their weight behind the initiative.

key can't be "cherry picked" from your work and then decrypted at leisure. Additional information is integrated with your media file, and depending on the nature of your work, is either saved as Windows Media Audio or Video (WMA or WMV respectively).

Step 2 You then distribute your work via your preferred method(s). Online download, streaming, hard copy distribution — any file transfer method. The end result? A user has now got a copy of your rights protected file, but not the key that will unlock it — yet.

Step 3 The end user then has to authenticate with your chosen licence server. As a content provider, you dictate the cost and conditions of use of your material. If the consumer "passes muster" and is permitted to use the media, the license key is forwarded to the user. In a commercial scenario obtaining the key may involve online payment or membership to a prepaid subscription service allowing access to a bank of material.

Step 4 The end user can now play the media — provided they have compliant software. Limitations on use of the media — such as time limits, number of times the media may be played, ability to copy — are all controlled via the digital licence incorporated within the media. The software you use to play the media will not allow you to contravene the conditions of the licence.

It's worth noting that in Microsoft's vision of DRM, if you do not have a Rights Manager-capable OS, then Rights Manager packaged media will not be playable on your PC. Further, it's no accident that the accepted output types are Windows Media Audio and Video.

MARCHING TO A DIFFERENT DRM: NON-MICROSOFT SOLUTIONS

At present, Microsoft's vision of DRM dominates the rights management landscape. No other competitor has demonstrated the scope or desktop penetration of Redmond. One issue is that the concept of DRM is anathema to open source communities. The main problem however is that potential competitors to Microsoft's DRM dominance lack one or more essential elements, such as organisation size, marketing budget, desktop reach or infrastructural support.

Apple certainly has the desktop penetration, if not the willpower, to take on such an undertaking. It claims that over 300,000 users, Windows and Apple alike, download its media player, QuickTime every day. QuickTime 5 alone boasted 100 million plus downloads, and the latest QuickTime, version 6, seems to be on a similar course. Technologically mature as the player is, Apple has steered away from positioning itself as an integrated DRM provider, preferring to create tools for developers to build their own solutions. Hence, Apple hasn't been talking about its own DRM initiatives, but has opted to direct attention to external developers.

Real Networks, on the other hand, is attacking Microsoft on a number of fronts. Favouring a gradual introduction of DRM technology into its ubiquitous player, RealNetworks' approach is one of a company believing the technology is still in its early stages. Dubbed the RealSystem Media Commerce Suite, RealNetworks' DRM solution is strengthened by Real Networks' involvement in MusicNet,

a music subscription service which includes partners such as AOL.

MusicNet too is in its early stages, its success hinging on the ability to successfully retain value of the product online without it being distributed for free via P2P, IRC and FTP. In turn, the realisation is growing that the only way to do this is to protect the media at the CD level.

IBM think there's merit in RealNetworks' technology as well, having aligned themselves and their own DRM solution, EMMS (Electronic Music Management System) with the Real product. IBM's partnership approach has also seen them integrate EMMS into Liquid Audio's non-proprietary format. IBM has put a lot of thought into EMMS, and the likely application. In a starkly different route to Microsoft's DRM solution, EMMS is open architecture.

Competitors like Real Networks and IBM teaming up in this fashion may seem peculiar, but in the DRM game it's the only way they have a chance. And the collaboration is working. Take RealNetworks' pushing of XMCL. Based on XML, XMCL (extensible Media Commerce Language) is the kind of solution that Microsoft dreads becoming a standard. XMCL allows communication between ecommerce back ends and a host of DRM technologies, not just Microsoft's. The success of such a standard would benefit both IBM and RealNetworks' DRM plans, as it makes both technologies viable and in tune with market expectations.

XMCL has some heavy hitters behind it. Adobe, MGM, Sony Pictures Digital Entertainment and Sun Microsystems have all thrown their weight behind the initiative. The broad array of interests — including makers of content creation tools, media giants and enterprise-level server solution companies — means that XMCL possesses real validity immediately. If the partners backing XMCL have their way, DRM's execution will be freed up beyond a proprietary format and process. Instead of being locked into a single vendor/approved partner model, content providers will have the freedom to select who executes each stage of the DRM process.

For now, however, the rest of the DRM competition lies fragmented. And Microsoft's solution is presently free and has been established. On the periphery, there is a bundle of media companies such as SkyStream Networks (www.skystream.com) that creates customised solutions which don't address the mainstream. The proprietary technology that a SkyStream may use to create secure content delivery of streamed TV and the like online may well be able to be ported later. It would certainly explain why big hitters such as Intel and AOL/Time Warner have invested in the company. Without a coherent plan for mobilisation to the common user, however, such technologies remain niche.

The basic DRM model — packaging of copyright material, hosting online, and validation of authenticity to trusted users — seems to remain the same amongst all offerings. The exception being that smaller outfits have attempted to retain a semblance of cross-platform integrity and compatibility. Pray for the ongoing health of such concerns. The DRM pill may be a bitter one to swallow for many, but while viable alternatives exist, at least consumers will have a choice of flavour. **ETI**

Case study: Warner Bros. says, 'That's all, folks'

It's easy to dismiss DRM movements as being too removed from the everyday user to be relevant. This is definitely not the case. Australian ISPs are beginning to feel the brunt as media companies seek to protect their copyright. APC was recently forwarded an email from an ISP operator that requested anonymity. Reprinted in full (see right), the email illustrates one method by which media companies are enforcing their copyright.

MediaForce Inc., is a New York-based company specialising in media infringement detection and remediation. In this case, it claims to be authorised to act on behalf of Warner Bros. The above approach represents the current response to copyright infringement — it's time-consuming, inconsistent, and expensive.

The life cycle of such an infringement might run as follows:

1. Copyright-infringing material is made available online (in the above case, KaZaA's P2P service).
2. Custom software employed by consultancies like MediaForce Inc. actively scour networks "sniffing" for suspect material. In the case of MediaForce, a process called "MediaSentry" is put to work. In the words of MediaForce: "Using a sophisticated network of Internet-based software and data mining techniques, MediaSentry patrols the Internet for copyright infringements. A continuously updated catalog of infringements is cross referenced against a database of your copyrighted works."

Critics suggest that such "data mining" practices, or the collation of details of offenders (including IP addresses) can constitute an invasion of privacy. Media companies and bodies like the RIAA (Record Industry Association of America) hit back by saying that the information it collates is publicly viewable by users of the "offending" networks, and thus is public domain. More controversial is the lobbying by such organisations as the RIAA and MPAA to sanction direct measures against people identified as offenders, including denial of service and possible hacking of suspects PCs.

3. The information collected online is compared to the database of client works — possible matches are investigated and a form letter (see right) is sent. As discussed in last month's Dispatch (APC November, page 20), treaty obligations agreed to by our Government mean that there is a level of compliance that can be demanded by overseas companies. When it comes to DRM enforcement, the scope for jurisdiction seems to be expanding to match that of the Internet.
4. The ISP must respond in a meaningful fashion to the request, or risk action themselves.

Wednesday, September 18, 2008

XXXXXXXXX IP Pool AU

RE: Unauthorized Distribution of the Copyrighted Motion Picture
Entitled Austin Powers Goldmember

Dear XXXXXXX Administrative Contact:

We are writing this letter on behalf of Warner Bros., a division of Time Warner Entertainment Company, L.P. ("Warner Bros.").

As you may know, Warner Bros. is the owner of copyright and exclusive distribution rights in and to the motion picture(s) listed above.

No one is authorized to perform, exhibit, reproduce, transmit, or otherwise distribute the above-mentioned work(s) without the express written permission of Warner Bros., which permission Warner Bros. has not granted to XXXXXXXXXX.

We have received information that an individual has utilized the above-referenced IP address at the noted date and time to offer downloads of the above-mentioned work through a "peer-to-peer" service.

The attached documentation specifies the location on your network where the infringing occurred, the number of repeat violations recorded at this specific location, as well as any available identifying information.

The distribution of unauthorized copies of copyrighted motion pictures constitutes copyright infringement under the Copyright Act, Title 17 United States Code Section 106(3). This conduct may also violate the laws of other countries, international law, and/or treaty obligations. Since you own this IP address, we request that you immediately do the following:

- 1) Disable access to the individual who has engaged in the conduct described above; and
- 2) Terminate any and all accounts that this individual has through you.

On behalf of Warner Bros., owner of the exclusive rights to the copyrighted material at issue in this notice, we hereby state, pursuant to the Digital Millennium Copyright Act, Title 17 United States Code Section 512, that we have a good faith belief that use of the material in the manner complained of is not authorized by Warner Bros., its respective agents, or the law.

Also pursuant to the Digital Millennium Copyright Act, we hereby state that we believe the information in this notification is accurate, and, under penalty of perjury, that MediaForce is authorized to act on behalf of the owner of the exclusive rights being infringed as set forth in this notification.

Please contact us at the above listed address or by replying to this email should you have any questions.

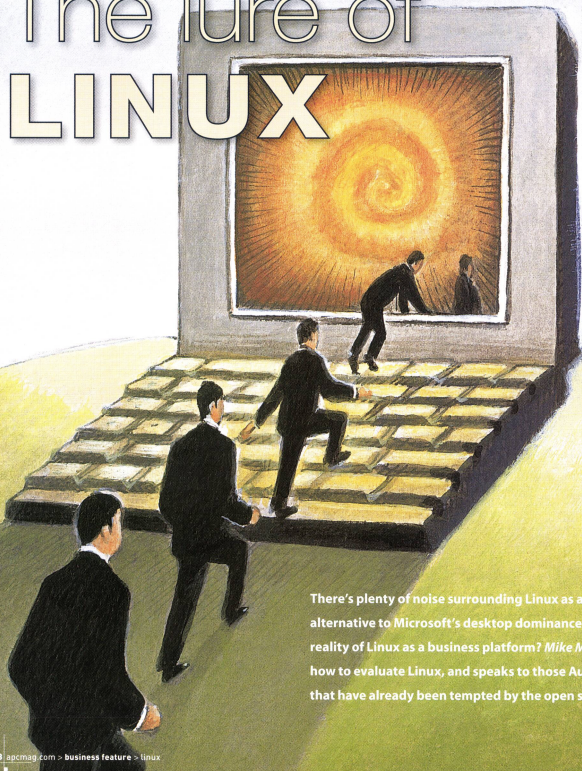
We appreciate your assistance and thank you for your cooperation in this matter. In your future correspondence with us, please refer to Case ID 336887.

Your prompt response is requested.

Respectfully,
Mark Weaver,
Director of Enforcement
MediaForce, Inc.
(812) 925-9997

Infringing Detail:
Infringing Title: Austin Powers Goldmember
Filename: Austin Powers — Goldmember.avi
First Found: 16 Sep 2008 21:46:55 EDT (GMT -0400)
Last Found: 16 Sep 2008 21:46:55 EDT (GMT -0400)
Filesize: 557,736k
IP Address: XXXXXXXXXX
IP Port: 1214
Network: KaZaA
Protocol: FastTrack
Username: XXXXXXXXX

The lure of LINUX



There's plenty of noise surrounding Linux as an open source alternative to Microsoft's desktop dominance. But what's the reality of Linux as a business platform? *Mike MacCana* explains how to evaluate Linux, and speaks to those Australian companies that have already been tempted by the open source platform.

The buzz around Linux is reminiscent of the stirrings surrounding the Internet before the dot com crash. In fact, many of the concepts that fascinated people about the Net also applied to the operating system: both began as academic projects, neither were owned by a specific organisation, and they were largely free for anyone to access and contribute to.

These factors meant that activity snowballed, building up from simple projects into a global phenomenon with great promise. And in both cases, it was also predicted that they'd quietly go away in favour of proprietary alternatives once the hype died down.

There's no arguing that some of the heat has gone out of the Linux market. Companies that had jumped onto the bandwagon, like Caldera and Corel, stepped away from the platform. Others, such as Linux desktop company Eazel, disappeared entirely.

But Linux, like the Internet, isn't about to go away any time soon. And the serious players in the Linux industry are doing quite well.

Red Hat is profitable and still expanding; IBM has recouped its billion dollars worth of Linux investment sooner than expected, and research firm IDC estimates that spending on Linux will increase from \$80 million in 2001 to \$280 million by 2006. The platform and its open source philosophy is no longer a left-of-field concept to the business world. Linux has become part, and in some cases the whole, of the IT infrastructure of many Australian businesses, earning a reputation for providing inexpensive and reliable file and print, email, Web and network infrastructure services.

More recently, with IT budgets feeling the strain of Microsoft's expensive new licensing model, businesses are looking closely at Linux. IDC reports that some 15% of Microsoft's customers are examining alternative technologies such as Linux following the introduction of Microsoft's Licensing 6 scheme.

Open source licensing of the OS and many applications delivers significant cost savings, and allows staff to replicate their work environment on their home machines for free. It also avoids licence audits and the cost of staff "borrowing" expensive software.

But Linux is also getting attention in its own right. Stuart Guthrie, from NSW systems integrator Eureka IT, says that his customers are "seriously looking at Linux — not just trying to arm-bend Microsoft [into a better licensing deal]."

While best known as a back office platform, for Linux the desktop is now the most promising frontier as well as being its biggest challenge. Only a short while ago, a Linux desktop looked like a mishmash of inconsistent applications which performed every task under the sun except what most desktop users need: a Web browser capable of displaying most Web pages; a good email client and contact manager; and an office suite which can work reliably with Microsoft Office files. That situation changed once mainstream Linux distributions began to direct their efforts towards Microsoft's heartland.

In common with many competitors, Linux market leader Red Hat once focused purely on servers. However, with its 8.0 release, the company aimed to deliver a polished, consistent desktop that anyone could use (whether it succeeded is another question — see our Workshop article entitled: "You can leave your Hat on," page 136).

The United Linux consortium (a group consisting of Caldera, SuSE, Turbolinux and Conectiva) has also announced an upcoming release with a clear desktop focus.

SWITCHERS AND STAYERS

Although Linux isn't yet up to the ease of use of Windows, it's getting there. Furthermore, as a desktop platform Linux offers a variety of advantages over Windows, particularly in terms of installation and maintenance. The tight set of default permissions is appreciated by administrators seeking locked down, tamper-proof desktops, which eases the maintenance burden and reduces the effects of malicious users and software.

Another frequently cited business benefit of Linux is the ability to easily produce a standardised roaming user environment. Kim Perkins, Information Systems Manager at Melbourne private school Strathcona Baptist Girls' College, explains that by using LDAP for authentication and the Network File

Australia's biggest ever Linux rollout

In April this year, the Northern Territory's Department of Employment, Education and Training, and consulting group CSM, signed off on the nation's biggest Linux deployment, with 192 Red Hat Linux servers installed in schools throughout the Territory.

In addition to LDAP directory services infrastructure, the servers provide DHCP, file serving, Web content filtering, email services (with anti-spam features and a Web-based front end) and DEET's intranet.

CSM Manager Jim Risby explains: "Linux certainly has advantages in cost — with the money we saved on OS licensing we could immediately afford to buy another thousand workstations — but another advantage we've found is that a single server can have more than one role in the network. We've found a single Linux machine hosting all these services more reliable than separate Windows 2000 machines."

These 192 Linux servers support 7,000 Windows-based client computers, which are installed from disk images on the server using a custom tool developed by CSM. The workstations run on Windows and proprietary applications, but are also getting a taste of open source applications.

"We gave the schools the option of either using StarOffice 5.2 or installing their own Microsoft Office instead," says Risby. "Most chose Microsoft Office, as StarOffice 5.2 wasn't really up to scratch. Version 6 is much more mature than its predecessor, and I suspect around a third of the schools will end up using it."

Risby considers Linux to be a very viable operating system for the small-to-medium enterprise and even the large enterprises. "We've proven there are no issues as far as reliability and scalability go. I think in the last couple of years we've seen a lot of vendors pay more attention to the platform than in the past, and application development for the platform is really starting to come of age."



System (NFS) to share users' home directories, staff and students "can sit down on any machine and get their own environment, which they can customise without harming the underlying OS. Users have remarked that it's like having their own machine," says Perkins.

While his team looked at doing the same for its Windows desktops using profiles and the policy editor, the process was "much more difficult and would have taken more time."

Strathcona has converted 90 student and staff desktops — half of its total fleet — to Linux,

and adopted Sun's StarOffice 6 suite on all Linux and Windows machines; the application is also available for staff and students to use on their personal systems.

"One of the problems we've had with Microsoft Office is that students save work here and can't open it [on their home PC] because of file incompatibilities," notes Perkins. "The choice is up to the student, and they can save their documents in Office formats if they choose to stick with Office at home."

Recurring software licensing is a major

component of the IT budget," he says. "Linux provided substantial cost savings, allowing us to spend those funds elsewhere." This includes more powerful desktop hardware, where the school opted for cutting-edge desktops with high-end nVidia graphics cards.

Switching to open source to trim licensing costs doesn't have to involve ditching Windows entirely. It might just mean employing some open source applications that run on Windows, such as OpenOffice, or the Gimp photo editing software.

The open source office

OFFICE SUITES

The desktop lives in a proprietary world. The ability to read, edit and save Microsoft Office documents is very important for

most users. There are many office suites available for Linux, but only a few provide the features, licensing and compatibility needed.

StarOffice 6/OpenOffice.org 1 share the same code base and file format, but the commercial StarOffice includes more templates, a better dictionary and other subtle changes to justify its price (which at \$189 is still very competitive against Microsoft Office). OpenOffice.org lacks these features but does the basics quite well, and is free too. The ability to export documents to PDF is an incredibly useful feature for businesses. On either Linux or Windows, OpenOffice.org deserves a close look.

If you still need to run Microsoft Office, at least on some Linux machines, try Codeweavers' Crossover Office, a Windows compatibility layer designed specifically to run Office (as a bonus, it also supports Internet Explorer, Lotus Notes and Quicken).

Forget about Koffice and AbiSuite, neither of which can export to the standard Office document formats; and steer well clear of Hancom Office, which despite a very polished look and appealing price tag, uses a proprietary file format.

This is a reason for concern, as your company could end up locked into that product based on the need to work with documents created in that format.

WEB BROWSING

Both Mozilla and Netscape 7 provide fast rendering and good support for most Web sites, although their menus are a little slow — 20-plus entries in your bookmarks and you'll notice it.

Opera remains the only major browser that supports proper zooming on Web pages, and is just as pleasant on Linux as it is under Windows. It can be purchased for a reasonable price or

downloaded as ad-supported software.

Konqueror is very versatile: it's also a simple file manager and network browser. It enjoys a slick interface and a powerful set of features, but doesn't cope well with non-standard HTML so it can have trouble displaying popular sites like ninemsn.

Also worth checking out is Galeon, which is Mozilla without the clunky interface.



► **Galeon:** This lean browser is Mozilla without the clunky interface.



► **OpenOffice.org:** Not just for Linux, this open-source suite runs on Windows too

GROUPWARE

There are several groupware clients for Linux which fully interoperate with Microsoft Exchange servers, including support for collaborative features. There are also open source server applications which work as drop-in replacements for Exchange,

and data can be easily migrated from Exchange to one of these using the exmerge tool from the Exchange CD.

Ximian Evolution with Connector is built around the Evolution PIM, an open source application with a very polished Outlook-style interface.

Connector is a proprietary (but cheap) add-on which allows Evolution to perform most Exchange-specific functions like group calendaring and meeting



► **Ximian Evolution:** An Outlook look-alike with Exchange server compatibility

invitations, although it lacks support for group folders.

Binary Tradecient is a simple mail client that supports Bynari Tradecient as well as Exchange. While performing most of the groupware tasks that Outlook does, it suffers from buggy performance and a very pedestrian interface.

Despite many attempts, we couldn't get Samsung's Java-based Contact Client to display properly.



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Ready, set, wait a minute . . .

Look before you take the leap to Linux: it'll save you time, money and tears, especially if it turns out that Linux isn't the best choice for your business platform.

Know your environment: Take stock of your existing applications. Large companies should look out for any departmental "glue" applications, such as document templates, low end databases and spreadsheets that may have been developed on an ad hoc basis outside the control of your IT department.

Identify clear benefits: Lower acquisition and maintenance costs are reported by most Linux users, as are reliability and security advantages. Predict possible problem areas and address them. Present your findings to management and get their support.

Use the resources available: Linux might be new in your organisation, but that doesn't mean you're on your own when it comes to support and advice. The wealth of Linux resources includes many consulting, software development, training and hardware vendors. Investigate these, especially if you don't have inhouse Linux experience. If your existing supplier doesn't support Linux, explore the competition.

Choose the right distro: A distribution targeted at enthusiasts won't be appropriate for a business environment. If your users and support staff are used to Windows, they'll need a solid, consistent and reliable set of graphical configuration tools to lead users through. Compliance with the Linux Standards Base is important for application support. The distribution company's local presence is also a large factor in getting approval from management. In these areas, Red Hat stands out from the crowd as a safe bet. Server-only deployments should also look at United Linux.

Check out the management tools: This is especially important for larger scale desktop environments seeking to automate the installation and maintenance of multiple machines. It was an area of concern to many organisations APC spoke to, so identify appropriate deployment and remote access tools early on. KDE 3.2's remote desktop and NetOp are good options.

Develop policies for managing your systems: Linux's flexible environment allows for great customisability towards your business' needs; however, it's important to be consistent in your approach. Otherwise, as with any OS, your machines will end up an unmanageable mess.

Plan on a phased migration: Users sometimes need time to adjust, and larger organisations can stagger the deployment through different departments over a period of time. Tools like Crossover Office, Wine, Win4Lin and Citrix can assist in this area.

Run a pilot program: Develop a solution, test it, gauge opinions from users. Re-build it, re-test it, and start again.

At the same time, there can be some hidden costs in rolling out Linux. Unix network administrators typically earn at least a third more than NT specialists, although they usually bring with them a good set of cross platform skills and extensive TCP/IP nous.

In some cases, the licence fee for Windows is almost forced upon the user. Very few of the name-brand vendors will sell a desktop PC without an included OS, and although Microsoft's licence agreement promises that the company will refund the cost of the software if you don't accept the licence agreement, trying to wring that refund from the Redmond coffers can take a lot of effort.

But it can be done, and as more companies move to Linux, vendors are readjusting their own approach with OS-free machines — especially "white box" makers, where removing the Windows licence can be the cost savings trump card that seals the deal against a larger player.

PILOTING LINUX

Not all companies find that Linux is right for them. When the NRMA was preparing to upgrade its ageing network of 1,200 desktops running Windows 95 and Office 95, Linux was one of many possible options examined. In April this year, the company conducted a two-month pilot which placed Linux throughout the enterprise: not just the run of the mill desktop applications but all centres, project management tools and accessing legacy applications via a terminal client.

The motivation was simple: a lower cost of ownership and faster return on investment. "Linux provided advantages in terms of both acquisition cost and [minimising] downtime," says Mick Moduszewski, the motoring group's CIO. "Being cost-effective is something the IT industry will continue pushing to become. Linux and open source could provide one of the vehicles for achieving that objective."

NSW consulting group Eureka IT built the pilot system based on the Debian Linux distribution, Gnome 2 desktop, OpenOffice suite and Evolution information manager. LDAP provided both a global address book and authenticated staff logons. The desktops also included Win4Lin, which allowed staff to run a Windows desktop within their Linux environment.

"Occasionally, people may knock up something in Access to perform a particular business function," explains IT manager Phil Went. "Given the level of change, it was important we had some kind of compatibility." The pilot system was deployed with Fully Automated Install (FAI), a tool for automating the Debian install process, while a package management front end allowed staff to install additional software in a standardised manner.

But in the end, the company decided to stick with Microsoft's Windows and Office platform, rolling out new systems running Windows 2000 and Office 2000. "We had a fully functioning desktop that could in theory cover all our needed applications," recalls Moduszewski. "But there were complexities in terms of being able to remotely manage a large number of desktops. The other main issue that we hit, although it was extremely close, was document compatibility from external organisations. Although we were looking at Openoffice.org, there was just too big a risk [of compatibility issues], particularly in the executive role."

However, the company continues to keep a watchful eye on Linux, says Moduszewski. "It's extremely robust, and the pace of change is phenomenal. During the pilot there was a feeling that Linux was probably six to 12 months too early. In the new year we'll have another evaluation, with a view to rolling out Linux to select business units. Within two years, I expect Linux to have significantly more market share. The development



Red Hat: In an effort to win over business users, Linux distros are paying more attention to their interface.



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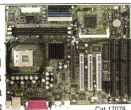


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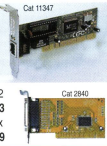


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community pushes into areas where they see weaknesses. If needs are addressed, more organisations would choose to cross that line."

THE RIGHT APPS FOR THE JOB

The main consideration with Linux on the desktop is the availability of applications. While most server vendors view Linux simply as another software platform, the desktop is a different story. Nobody sits down at work with the intention of using an operating system per se — people have real tasks that they want to achieve, and the biggest influence over this process is the applications they use to do those tasks.

Linux has a wide variety of basic business applications that work similarly enough to their Windows counterparts (see box story "The open source office" on page 120). However, specialised application support is less certain, and this is often the largest factor in deciding whether Linux is appropriate.

Even if your specific business application doesn't support Linux, all isn't lost. Speak to your application vendor — they'll never port to the platform unless their customers tell them to. After that, look at competitors — no matter whether it's video editing or accounting, you'll find a lot more applications for Linux than you think. While some may not meet your needs, others often have better features than their Windows counterparts.

Alternatively, there are Windows interoperability tools to run Windows applications on Linux, such as Citrix Metaframe, Crossover Office, Wine and Win4Lin. Many organisations that migrated from Windows to Linux have kept some form of Windows application compatibility in their Linux environment until it was made unnecessary, because of a Windows-to-Linux port of that software, the appearance of a competitor or the development of an inhouse solution. These tools can also be used to assist phased migration to the platform.

Support is also vital, and it's in this area that the Linux distributions differ most significantly. Linux may level the playing field between vendors, and there's no company that has the same power over Linux that Microsoft has over Windows, but you'll get more business support using Red Hat than almost any other distribution.

Jim Risby, whose company CSM implemented Linux-based groupware and directory services systems for two government tenders, explains: "We chose Red Hat for a number of reasons. They were the biggest vendor here in Australia, they had more people on the ground and more support staff, so from a risk mitigation perspective the Red Hat product was more attractive."

Strathcona's Perkins made the same decision and, when he discovered a bug in the OS, was impressed with Red Hat Asia Pacific's support. "When we brought it to their attention they responded quickly with a work around that solved the issue," he says.

Is Linux right for your environment? For many organisations APC spoke to for this article, it was. For others, it wasn't. To those considering Linux, Jim Risby speaks from experience when offering this advice: "Be bold. Have a look at your options and be prepared to think outside the square with your business objectives in mind." **ETC**

Developers' OS of choice

At business intelligence software company RedSheriff, software developers are given their own choice in desktop operating systems. For most, this means open source — either Mandrake 8.2 or FreeBSD. Technical Release Manager Brendan Oliver says that "from a development point of view, it's whatever you're most comfortable with and what gets the job done".

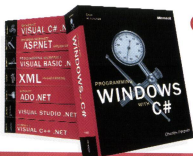
The team of 10 developers who work on RedSheriff's reporting tools use six Linux Mandrake 8.2 desktops, three machines running BSD and two Windows machines for testing how Web pages will appear on Windows browsers. "Our applications are primarily based on Java, Perl, C and C++... we've had no reason to use Windows development tools," explains Oliver.

Source code is managed using the Concurrent Versioning System (CVS), and may also run software needed to test client applications, such as Apache, Postgres SQL and Netbeans. Staff also nominate their own email client, code editors and office applications, and the environment changes as needed.

"Whoever's working on the project will take care of figuring out what environment we're going to need, downloading various components, decide what we need and what versions we were going to use, set up a CVS repository, dump everything in there, and then publish a document where to find it and how to run it," says Oliver.

Hardware compatibility is rarely an issue. "It just runs — we've never had to bother about compatibility issues all that much. Every once in a while you might find something that doesn't run quite right, but we've found if we go back out and get the next release of the kernel or the distributions then the support is there and we still don't have to worry about it."

Support, too, poses little problem. "We can solve most problems ourselves, and there's many other resources out there in the Linux community if we need a hand."



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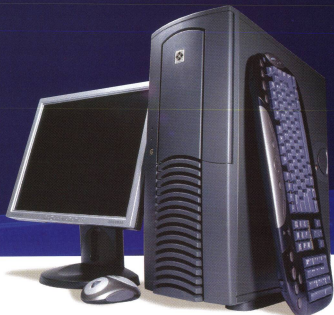
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WORKSHOP

Hands-on with hardware and software, plus bonus CD content

There's a lot of OS action in this month's Workshop. Good, meaty hands-on operating system stuff. The stuff you love to read and we love to write about. Stuff like Red Hat 8.0, which overwhelmed our resident Linux expert Matt Overington, so much so that as we write this, Matt's uninstalling Red Hat 8.0 so he can go back to Mandrake 9.0.

Stuff like "slipstreaming" Windows 2000 and Windows XP, where we show you how to build and burn a fully-updated bootable CD version of each OS that'll speed up your next (inevitable) re-install.

Stuff like an under-the-covers look at the new Palm OS 5, and how Palm's shift from the DragonBall processor to the new ARM platform will affect your favourite Palm apps. There's plenty of non-OS stuff, too. Just run your eyes down the content panel (to the right), and enjoy this month's serving of power computing for the power user.

Workshop's site of the month



Not a week goes by without a new OS popping up on mirrors across the globe. OSNews' Eugenia Loli-Queru has reported on operating systems since working on the now-defunct BeNews.com site, and has become a trusted guru. We recommend www.osnews.com for up-to-date news regarding operating system developments and reviews.

Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD set — just look for this icon. This is often software that is integral to the article, such as this month's features on tweaking nVidia cards or creating a Service Pack-updated boot disk of Windows. The selection ranges from full-working versions and trial versions to shareware and freeware.

APC cannot provide tech support for these programs, but if you've got a problem with the CD itself, by all means holler our way (see pages 8-9 for details of how to contact our CD team).



In Workshop this month

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Sharing ADSL

Are you a Telstra ADSL user baffled by Windows' Internet Connection Sharing? Here's a few tricks to set things right.



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Getting the best out of IIS

Tips and tricks that make Internet Information Server work harder and faster.



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You can leave your Hat on

Now that Red Hat 8.0 is finally here, we ask: what's all the fuss about?



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Slipstreaming Windows

Roll a bootable CD containing Service Pack-updated builds of Windows and Office.



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Perl revisited

Want to make your Web forms more interesting? Learn how to turn your Web site into an interactive masterpiece.



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True printing with CSS

Use CSS to design Web pages that print on paper almost as accurately as they display onscreen.



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nVidia to the max

We let you in on some top tweaking tips and secret settings that really will get your nVidia card sizzling.



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Getting inside Palm OS 5

Almost two years in the making, Palm's new OS is finally here. We examine what's new.



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Web interfacing with Photoshop

Invigorate dull Web interfaces with ImageReady.





Sharing ADSL

Are you an ADSL user baffled by Windows' Internet Connection Sharing? If so, Darren Stribling has a few tricks to set things right.

For most home and business users, ADSL is the broadband connection of choice. And most of those users connect through Windows. So with the the Internet Connection Sharing facility built into all versions of Windows from 98SE onwards, most broadband users have all the plumbing they need to pipe their connection through a small network.

If only it was that simple! ADSL has several peculiarities which, when matched to Windows' ICS, can make for a very frustrating experience. Here's what you need to know to iron out the wrinkles.

UNDERSTANDING ICS

Like many parts of Windows, Internet Connection Sharing (ICS) has evolved with each revision of the operating system. The first version of ICS gave fairly rudimentary access to multiple users, but became somewhat complicated when its Network Address Translation (NAT) layer needed to be broken to allow access for services like online game servers and remote access applications.

Users began seeking ways to "map" ports through the NAT layer, which led to the creation of the ICS Configuration Utility for Windows 98SE (www.practicallynetworked.com/sharing/ics/icsconfiguration.htm).

Microsoft also took note of this shortcoming, and introduced in Windows 2000 the ability to map ports and create rules through a GUI interface. Windows XP takes ICS several steps further and includes a built-in firewall.

Here's how to get ICS working with ADSL, using Windows XP as the operating system and Telstra Big Pond (Australia's most popular ADSL service) as our example.

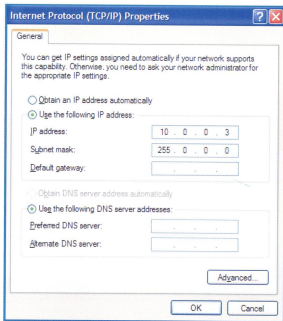
HOW ICS WORKS

ICS requires two network interfaces: a Wide Area Network (WAN) interface which connects to the Internet via the cable or ADSL modem, and a Local Area Network (LAN) interface which connects to the networked computers.

In the case of cable Internet, this means two network cards: one for the cable modem, and a second for the hub or switch on the local network.

ADSL is slightly different in that it uses a virtual Point to Point over Ethernet (PPPoE) adaptor which acts as the WAN adaptor. This means it's possible to plug an ADSL Ethernet modem into a hub and have both WAN and LAN interfaces using the one physical network card in the ICS Server.

To explain further, the PPPoE adaptor isn't a physical device but it does need a physical device to ride on. This can be the same network card, as PPPoE comes with its own TCP/



► **IP tricks:** assigning a dummy IP address to the network card that the ADSL modem is plugged into stops the PC searching for a DHCP server it's never going to find.

IP binding which leaves the network card's TCP/IP binding free to be used for the LAN.

SOFTWARE CONNECTION CLIENTS

There are three main types of software connection clients in use in Australia for ADSL (Ethernet, RASPPoE and Windows XP's ADSL client), along with some proprietary clients bundled with ADSL modems.

Each client exhibits the same problems when used with ICS — while email and chat programs will usually work, the network won't be able to browse most Web sites.

This is a shortcoming with ICS caused by non-standard Maximum Transmission Units (MTU). MTU is defined as a restriction on the maximum number of bytes of data in a single transmission. Depending on the connection method being employed, there are several ways to solve this problem.

Another common problem with Ethernet ADSL modems is that the host PC becomes noticeably sluggish in its boot time and day-to-day running. This is because the PPPoE protocol needs an Ethernet card for its physical interface but carries its own TCP/IP stack, which leaves the TCP/IP binding on the actual Ethernet card with no purpose.

By default, the card's TCP/IP binding will be set to automatically obtain an IP address (DHCP) so the PC starts searching for a DHCP server that it's never going to find! The solution to this problem is to assign a dummy static IP

Getting the **best** out of **IIS**



Got Internet Information Server 5.0 running your Web site? **Serdar Yegulalp** reveals the tricks that make IIS work harder and faster.

Out of the box, Microsoft's Internet Information Server 5.0 has a reputation for speed and ease of manageability. But IIS 5 also has great untapped potential that needs to be liberated. On high-traffic sites, and even on not-so-high-traffic sites, those standard "out of the box" settings just won't cut it. To unleash the real power of IIS, you'll need to do some tinkering.

Some of these actions involve Registry edits or changes to IIS's Metabase; some involve hardware tuning; some are scripting and programming suggestions that apply to people using ASP and SQL Server, as well as other language and database packages.

It's not likely that any one of these changes will result in an explosive increase in speed (with a couple of notable exceptions), but taking many suggestions together will almost certainly improve things.

CHANGE SETTINGS FOR THREADING AND CONNECTIONS

This is one of the very few changes that even Microsoft recommends making right off the bat to improve IIS's performance. IIS by default only uses a maximum 10 threads to handle incoming requests for pages. This means that if 10 requests are being processed by IIS and an 11th comes in, it will have to wait until one of the other 10 are fulfilled.

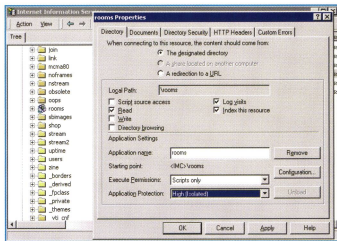
On sites that don't get a lot of concurrent traffic, this isn't bad, but a site that gets a lot of people using it at once (such as a community or portal site) will choke much more often, and at times appear to come to a complete stop.

Two Registry settings in IIS control how IIS uses processors and threads: `ProcessorThreadMax` and `RequestQueueMax`. Both of these Registry settings are found at `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W3SVC\ASP\Parameters`. `ProcessorThreadMax` is the number of threads per processor that IIS spawns.

By default, IIS 5.0 is set to only use 10 threads per processor. Set this value to 20 as an experimental new value. It can be increased to values even higher than that, although Microsoft doesn't recommend it — too many threads can actually slow things down, not speed them up.

`RequestQueueMax` is the total number of requests that can be waiting to be serviced by IIS. Start this at 100 or so and work your way up if you find your site generating a lot of Server Too Busy errors.

Note that you will need to stop and restart IIS completely every time you make one of these changes. For more detailed



► **On its own:** set a portion of your site to run in its own process. This is best for sites which have a lot of traffic in several different sections, each of which need its own concurrent processing.

information on making these changes, there is a whitepaper from Microsoft that talks about adjusting thread settings at www.microsoft.com/serviceproviders/whitepapers/tuningiis.asp.

STAY UPDATED ACROSS THE BOARD

Windows 2000 and its attendant system components, including IIS, are constantly being updated, upgraded, revised and modified. Staying on top of all of the different changes being made to Windows 2000 can be a bit daunting, so to that end we've compiled a list of places to get the most important changes that concern IIS and its attendant technologies.

Windows: Almost all the major Windows 2000 updates, including Service Packs, can be found at Windows Update (<http://windowsupdate.microsoft.com>). Service Pack 3 has just been released at the time of writing, and it's got quite a few under-the-hood improvements for both Windows 2000 and IIS 5. If you haven't installed it, do so, but make a backup of all critical system data and be sure to select the option to uninstall SP3 if things don't work out.

If Windows Update includes changes to Internet Explorer, bear in mind that many of IE's components, especially the Windows Scripting Host, are of paramount importance to IIS and should be kept up to date.

Windows Scripting Host: WSH is one of the core technologies in IIS that makes things like ASP (Active Server Pages) possible. Earlier versions had memory leakages and some other bugs.

Get the 5.6 revision, which can be downloaded at <http://msdn.microsoft.com/downloads/default.asp?url=/>

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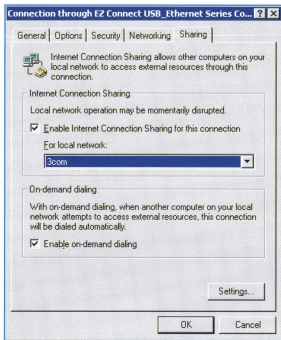
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► **ICS configuration:** will automatically configure the second network card.

RASPPPOE

This freeware PPPoE client (included on this month's cover CD) is the best way to connect to ADSL with Windows 2000 and even Windows XP, particularly when you also want to use ICS. It's very similar to XP's built-in PPPoE client, but with more features.

As before, the ICS server will usually have two network cards, which will show which adaptor needs a dummy IP address and which needs to be shared when using an Ethernet ADSL modem.

Open the Control Panel, Network And Dial-Up Connections, right-click the adaptor plugged into the modem and select Properties. Select TCP/IP Properties, IP Address, Specify and allocate an internal IP (we suggest 10.0.0.3). Set the Subnet Mask to 255.0.0.0; then click OK and restart if prompted.

SETTING UP RASPPPOE

When you've loaded RASPPPOE from the CD (or downloaded from <http://user.cs.tu-berlin.de/~normanb>), create a new folder and name it raspppoe. Then unzip the contents to it and open the Control Panel.

Run Network And Dial-Up Connections, right-click either network adaptor and select Properties. Click Install, select Protocol and click Add. Choose the Have Disk option and browse to the folder containing the unzipped RASPPPOE files. Respond Yes to each Microsoft Digital Signature, then close the properties for that adaptor, but don't reboot if prompted.

Select the properties of the network card connected to the LAN, uncheck the box beside PPPoE, click OK to everything and restart the PC.

On reboot, open the RASPPPOE folder and run RASPPPOE.EXE. Click Query Available Services and it should

find your ISP's server; click Create a Dial-up Connection and a shortcut will automatically appear on the desktop.

Run the new shortcut and enter your username and password. Note that most ADSL ISPs require @something after the username (e.g. Telstra uses @bigpond). To add the DNS Suffix with RASPPPOE, right-click the new dialup icon in Network Properties and select Properties.

On the Networking tab, select TCP/IP properties, Advanced and DNS, then at the very bottom of the page, enter the appropriate DNS Suffix.

ENABLING ICS

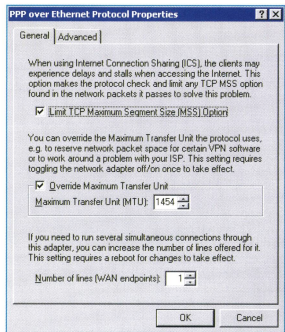
Run the Control Panel's Network & Dial-Up Connections applet and right-click on the Dial-Up Entry created by RASPPPOE. Select Properties, click the Networking tab, select TCP/IP Properties and click the Sharing tab.

Tick the box labelled Enable Internet Sharing for this Connection; select the correct Adaptor for Local Network, and the second network card will be automatically configured to the IP address 192.168.0.1.

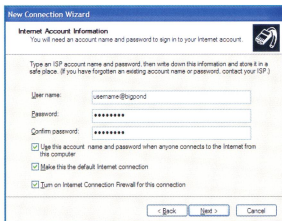
FIXING THE MTU ISSUE WITH RASPPPOE

RASPPPOE can also solve MTU hassles. Once again, launch the Network and Dial-up Connections applet in the Control Panel, then select the properties of the adaptor that the modem is plugged into.

Select the properties of the PPPoE Protocol and tick the option to Limit TCP Maximum Segment Size. Also tick Override Maximum Transfer Unit and set this to 1454. After restarting the PC, you can set up the client PCs using exactly the same method as used for the XP host, although the MTU settings need no special changes. tiny.cc



► **PPPoE Protocol:** solve MTU issues by overriding them.



► **Account information:** enter your username and password for the connection. Don't forget to include **@bigpond** after your username.

address to this adaptor. Here's an example of how to fix this problem when using Windows XP's ADSL login client. We're using two network cards in order to show which adaptor needs a dummy IP address and which needs to be shared through an Ethernet ADSL modem.

Open the Control Panel and choose Network Connections (select Classic View if it's hidden). Right-click the adaptor plugged into the modem and select Properties, then select the TCP/IP properties.

Tick Use The Following IP Address and give it any internal IP (I suggest 10.0.0.3, with the subnet mask set to 255.0.0.0). If Windows prompts you to restart at this stage, don't — just carry on and activate the login client.

Go to the Network Tasks menu, select Create New Connection and select the default Connect To The Internet, then select Set Up My Connection Manually.

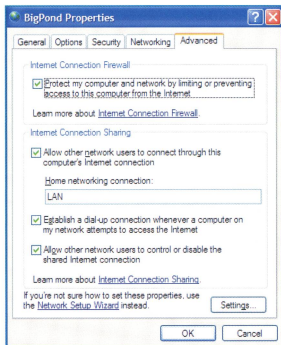
Choose Connect Using A Broadband Connection That Requires A Username & Password, and enter your username and password for the connection (don't forget to include **@bigpond** after your username). Note that ticking the three boxes in the lower half of the window will automatically activate XP's firewall.

Click on Finish and from the connection window that pops up, select Properties and go to the Networking tab. In Type of Broadband Connection you should see Point to Point Over Ethernet. Select the TCP/IP protocol, click Properties, Advanced and go to the DNS tab.

At the foot of the tab sheet, include the ISP's DNS suffix — no matter which state you're in, BigPond's DNS suffix is **vic.bigpond.net.au**. Close everything and double-click the new icon to connect.

To enable "dial on demand" and automatically establish the connection when Internet Explorer is launched: open Control Panel, Internet Options, Connections and tick Always Dial My Default, then select the ADSL connection and make it the default if it isn't already.

The final stage is to enable sharing with the new adaptor over ICS. Right-click on the new ADSL icon in Network Properties, select Properties, and tick all the boxes on the Advanced tab. Also, be sure to select the correct adaptor for the LAN in the pull-down list.



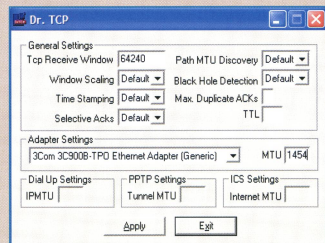
► **Enabling ICS sharing:** be sure to select the correct adaptor for the LAN in the pull-down list.

To configure each of the client PCs on the network, open each PC's Control Panel and select Network Connections. Right-click the network adaptor and select Properties, then choose to inspect the properties of TCP/IP and ensure everything is set to Automatic.

In order to send email, the client PCs will usually require a DNS Suffix relevant to the ISP (as before, all Telstra users go through **vic.bigpond.net.au**).

Solving MTU slow-downs

One way to quickly fix MTU issues that prevent adequate browsing on the client PCs is with the Dr TCP tweaking utility (included on this month's cover CD, or online from www.dsreports.com/front/drtcp.html). The settings shown here will get things running right again.



[downloads/sample.asp?url=/msdn-files/027/001/733/msdncompositedoc.xml](#).

SQL Server: Both SQL Server 7 and 2000 have service packs and post-SP updates available specifically for them. The latest Service Pack for SQL 7 is SP4, and you can get all the most recent packs and fixes at [www.microsoft.com/sql/downloads/default.asp](#).

Microsoft Data Access Components: Also known as MDAC, this is the "middleware" that sits between SQL Server and applications like IIS. Earlier versions of MDAC were also bug-ridden and leaked memory badly under heavy use, but the newest revision, 2.7, cleans up a lot of the problems from previous editions and is notably faster as well.

Go to [www.microsoft.com/data](#) to get the most recent version of the MDAC engine. No matter what database you're using, this is a good thing to keep updated.

SEGREGATE YOUR APPLICATIONS

IIS allows you separate different Web applications running in IIS. If you have one section of your site that you know is going to get 10 times the traffic of another section, spin it off as its own app. This will allow that part of the site to run in its own process, with its own thread. If that process dies or crashes, the rest of the site will still work fine.

This isn't as important on a site that serves static pages exclusively, but if one part of the site runs scripts or ISAPI DLLs in greater proportion than the rest of the site, consider breaking it out into its own app.

To do this, open the IIS management app and expand the tree in the left-hand pane for the site you're working on. Right-click the folder that contains the part of the site you want to spin off as its own app, and select Properties. Under the Directory tab, click the Create button and under Application Protection, select High (Isolated).

Leave Execute Permissions at Scripts only. Click OK and the new app will be created.

REPLACE ASP SCRIPTS WITH DLLS ON HIGH-TRAFFIC SITES

If you have a site that is built primarily with ASP scripts using VBScript or JavaScript, you may want to consider replacing the scripts with a compiled ISAPI DLL, either written in Visual Basic or C++. The reason? Speed and efficiency. VBScript and JavaScript are converted to a byte-code runtime format when they're executed, but they're still essentially interpreted languages. DLLs are machine code and run many times faster, not to mention many times more efficiently.

If you are constantly modifying or updating the code on your site, this may actually not be the best idea. For one thing, if you want to replace a DLL with a new revision, you have to stop the whole site, unregister the old DLL, replace it with the new one, re-register it, and restart the site again. Not a good idea if you're trying to stay up continuously, and a terrible pain to do more than once a day.

Also, you only really see the benefits of replacing scripts

with DLLs on sites that get extremely high volumes of traffic. The best thing to do may be to wait until you have pages that almost never change, and then replace those with DLLs when you feel they are "locked".

TWEAK INTERNAL CACHING

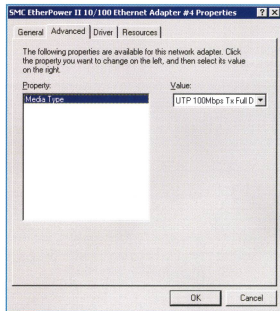
IIS maintains its own internal memory cache, separate from the system cache, for serving out pages from memory. By default this is set to half the available physical RAM in the system, but IIS almost never uses that much, and you can reduce that considerably without offsetting IIS performance if you're running other server apps on the same box.

To change the cache size you'll need to add (or edit) a Registry key: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\inetinfo\Parameters\MemCacheSize. This is a REG_DWORD type key, calibrated in MB. Check how much the total size of your site is, add 4-8MB for overhead, and set the key to that size.

CLOSE AND DESTROY

When objects are created in a page using VBScript's `Server.CreateObject` command, they need to be closed and destroyed before the page is terminated. IIS's internal garbage collection for objects is not very good, and if an object isn't destroyed before a page stops processing, the memory allocated to it may not be freed up. After a while, the clutter becomes so bad that IIS may stop working altogether.

The solution to this is simply good programming hygiene, which is something any conscientious programmer should



► **Give autodetect the boot:** set the network card in your IIS server to use the actual speed of your network media, not autodetect.

Workshop

have as second nature. A typical example of this in VBScript would read something like:

```
Set variablename=Server.CreateObject(ObjectType)
... [processing with variablename]
Close.variablename
Set variablename=Nothing
```

Close and Set ... Nothing are both important. Close instructs the VBScript engine to dispose of the space used by the connection for the object — usually a connection to a data source — and Set ... Nothing tells the VBScript engine to destroy the object itself and re-use the memory it occupied. Both are important. Connections are held in a pool by the connection manager, and can be intelligently re-used to save processing time and memory.

This example isn't limited to VBScript, but since VBScript is one of the most commonly-used languages with IIS, it's a good way to demonstrate the methodology.

PARTITION YOUR DATA

If you're using a database application, keep your database as segregated as possible from your Web files. Put the database on a separate partition or hard disk, or even another server if you can (although if you do that, make sure they have the fastest possible network connection between them).

Also, keep your Web files in a separate partition or hard drive from your OS files, again to increase parallelism. A system with a RAID array allows you to put more things on the same partition or drive (since partitions and drives in a RAID array are highly virtual and parallelised to begin with), so this is a good argument for a RAID setup with your server if you can afford it.

DON'T SKIMP ON RAM

RAM is very cheap. In many cases you can get more of a

performance increase by adding RAM than you can by upgrading a processor or even moving to a faster machine with the same amount of RAM. A server with 512MB of RAM is almost standard today. Since Windows 2000 Server can natively support up to 2GB of RAM, don't hesitate to make as much use of its capacities as you can.

This doesn't just apply to sites with active pages or scripting code — it also applies to static pages, which get served much faster out of RAM than they do off the hard drive.

CONSIDER CACHING AND COMPRESSION

IIS's internal caching and content-compression algorithms, which store commonly-used data in memory and compress data before sending it out over the wire, aren't always the best choices. There are a few third-party applications that do caching and compression for IIS. Among them is XCompress IIS. For more info, log on to: <https://secure.xcache.com/home/>.

CHECK YOUR NIC

Check the network card, or NIC in your IIS server, to see if it's up to the job of supporting a server. Many servers put together "by hand" feature a standard off-the-shelf NIC that's fine for workstations. But, if you are serving a site that has high demand, a cheap and conventional NIC may fall short in a lot of areas. Drop the cash for a network adaptor that is designed for servers; better NICs can handle a high volume of concurrent incoming connections intelligently.

Also, make sure the NIC on the server is not set to autodetect your network media. If you're using a 100Mbit full duplex connection, set the adaptor explicitly to use 100Mbit full duplex. Many adaptors don't autodetect connections correctly and can reduce throughput without you realising it. To do this, right-click on the Properties for the adaptor, select Advanced, and under Media Type or Connection Type (it varies depending on the type of card) select from the Value box 100 megabit full duplex or the closest match. www.redhat.com

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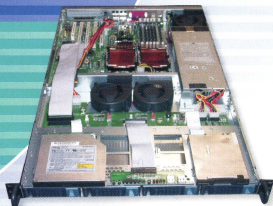
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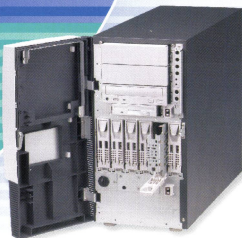


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You can leave your Hat on



Now that Red Hat 8.0 is finally here, Matt Overington asks: what's all the fuss about?

Red Hat is seeking to create a simple, powerful Linux distribution that can stand head-to-head with Microsoft Windows in a corporate environment. The latest version comes with an office-focused set of productivity tools and a clean, new look to woo corporate users towards Linux.

Red Hat's size, relative success and policy of creating an easy-to-use Linux distribution have caused many geeks to refer to it as the Microsoft of the Linux world. Striving for a unified appearance, simplified package installation system and robust driver set isn't going to hurt any Linux distribution.

Red Hat 8.0's core components include GCC 3.2, GTK+ 2, kernel 2.4.18, Gnome 2.0.1, KDE 3.0.3 and OpenOffice.org 1.0.1, keeping it in line with Mandrake 9.0. The only real difference is that Mandrake 9.0 comes bundled with kernel 2.4.19, which provides a few extra goodies, like improved FireWire handling and some updated drivers.

Red Hat has stuck with kernel version 2.4.18 since its 7.3 release, and has modded and patched it according to its own needs. This tends to make the kernel unnecessarily bulky, slow and hard to patch, but also gives the chance to improve security and add some minor bug fixes.

We downloaded the five ISO files from Red Hat's overhauled FTP site, and managed to get Red Hat 8.0 up and running within hours of its release. After booting from the first CD and being greeted by the now-familiar Anaconda installer,

we were on our way in minutes. Anaconda has been updated slightly to include anti-aliased screen fonts and GTK+ 2, but otherwise it remains largely the same as previous versions. It picked up our Samsung SyncMaster monitor and Asus GeForce 3 card without any problems (although the GeForce 3 was detected as a "generic GeForce 3").

The language support and driver collection have been beefed up slightly, and you are given 19 languages to choose from by default, including Ukrainian, Japanese and Korean.

Our generic keyboard was picked up without a problem, but Anaconda was tripped up by our mouse. The mouse is not uncommon hardware — a USB Microsoft Intellimouse — but Red Hat only detected it as a generic, three button unit. We manually changed the setting to use the correct Microsoft Intellimouse driver, but we still didn't have use of the scroll wheel. It wasn't until we killed the X-server and restarted it that we managed to get mouse support. Given that this mouse is extremely popular, we'd have thought this was something Red Hat could get right (both Mandrake 9.0 and Lycoris Desktop/LX had no problems with the Intellimouse).

DRIVE SETUP

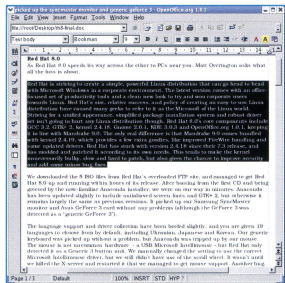
As per version 7.x, you can choose to autopartition your drives, launch Disk Druid (a GUI partitioning application) or take the full geek approach and use fdisk. Disk Druid has remained largely unchanged from Red Hat 7.3 and is still the preferred method for configuring your disks.

After the drives are set up, you are taken to the package selection screen. Red Hat has relied in the past on Gnome for its desktop environment, and Gnome 2.0 is selected as the default desktop under version 8.0, although KDE is also present. KDE is not installed by default, but can be added with a few clicks when selecting the packages. Strangely, when you select KDE, a few packages — such as Kaboodle (the KDE media player) — are disabled by default.

KDE's relationship with Red Hat has been tenuous at best, culminating in KDE programmer Bernhard Rosenkranzer quitting Red Hat over changes to KDE's code during the development of version 8.0. KDE has been modified slightly in its appearance (and the annoying "About KDE" box has been moved), but it retains its functionality.

You can manually select the packages to install, but we opted to go the whole hog and dump every package onto the hard disk. You'd be mad to opt for an installation as bloated as this, but it worked a treat for testing. The installer software took approximately an hour to complete, transferring 4.7GB worth of packages to the hard disk. During this time you are given updates on package progress, total progress and a running tally of the packages already copied to the drive.

After everything was installed, we created a boot floppy and restarted the machine. The Red Hat Setup agent kicked



► All clear: anti-aliased screen fonts help OpenOffice.org's text rendering.

► **Innovation:** the new Bluecurve GTK+ theme is an attempt by Red Hat to standardise the appearance of its menus.

in and guided us through configuring the date and time, and then the configuration of the soundcard. If you register, you can connect to a network connection and run the update agent. This downloads and installs new packages much like the Windows Update feature does for Windows. If you refuse to register, you cannot access this feature.

BLUECURVE

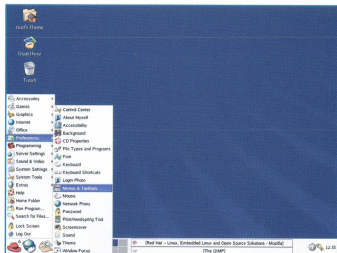
Bluecurve is an interesting innovation from Red Hat. It tries to force a unified look and feel across all applications. It's a new GTK+ theme that sits halfway between Gnome and KDE. Essentially it makes Gnome look more like KDE, and vice versa. Full versions of Gnome and KDE are there, and you can disable the Bluecurve interface if you wish. Bluecurve gives you some benefits, like anti-aliased text.

Unfortunately Red Hat's attempt at creating a single, unified theme hasn't quite hit the mark. Many programs that don't rely on the latest GTK+ still maintain their Gnome- or KDE-specific appearance. This goes for applications that rely on GTK+ 1, or KDE 1 or 2. This leads to a desktop environment where most windows and buttons look the same with a few glaring exceptions.

Red Hat is to be commended for attempting to unify the appearance of applications, as the dog's breakfast appearance of most X sessions is unappealing to people used to the single, unified experience of Windows, Mac OS, or BeOS. Unfortunately all the applications should be updated to support a common theme or be left out. It sounds ruthless, but it's the only way to achieve the unified appearance that Red Hat is aiming for.

MENU SYSTEM

If Red Hat is aiming to get Red Hat 8.0 onto the desktop of corporate machines across Australia, then work has to be done on the menu systems. Both the Gnome and KDE menu systems are confusing, and it's hard to remember where to look to find a certain settings box. For example, there are four separate configuration sub menus if you are using Gnome, labelled: Preferences; Server Settings; System Settings; and System Tools. To the experienced user this is bearable, but for



someone that's new to Linux this seems obscure, confusing and even alienating.

If Red Hat is striving to create a simple, powerful distribution to gain acceptance in the corporate market, perhaps they should start by looking at Lycoris' menu screens. Lycoris Desktop/LX has a long way to go in terms of creating a solid installer and improving driver support, but at least the menu systems are heading in the right direction.

The package set that comes with Red Hat 8.0 is good: it comes with GCC 3.2, GTK+ 2, Gnome 2.0 and KDE 3.0.3. OpenOffice.org is included, as is KOffice 1.2, so you get a solid selection of the most common Linux applications. Red Hat has worked with OpenOffice to ensure that anti-aliased fonts are rendered correctly, which substantially improves the appearance when you're working on a text document. In keeping with its assault on the corporate environment, Red Hat 8.0 comes with Ximian Connector, which is useful for accessing Microsoft Exchange servers under Linux.

One of the best new additions is the inclusion of a dedicated fonts directory. If you create a folder called ~/.fonts, you can copy all your TTF fonts to that folder and they are accessible by most GTK+ applications. Unfortunately this doesn't extend to all GTK+ applications, and we found it frustrating that we'd lose access to our fonts under OpenOffice.org and Gedit.

This sort of inconsistency is rife in Red Hat 8.0, which

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Slipstreaming Windows



Ashley McKinnon demonstrates how to roll a bootable CD containing SP-updated builds of Windows and Office.

Reinstalling Windows is a necessary evil. It's the last-ditch resort to system hang-ups and driver detritus, so you can start with a completely fresh slate. But with an abundance of patches and service packs released after the OS itself, your original Windows install CD is far from "fresh".

The same goes for Office. Office XP, for instance, has two service packs to be retrofitted once you've completed the CD install. That's a lot of downloading and hassle you can do without (pity the person who doesn't have a fast Net connection that day).

Here's the clever workaround — a way to update the original CD install files with the contents of the latest service packs, and then copying the whole thing onto a single CD that lets you install or reinstall Windows with the Service Packs already applied. It's called "slipstreaming", and it's so easy you'll wonder how you ever did without it.

Slipstreaming is a four-stage process. First, copy the original OS install files onto your hard drive. Then, download the latest Service Pack and use a command-line switch to unpack its files (without installation) into a separate directory. Another command line switch lets you update the original OS files with the contents of the Service Pack. Finally, burn the OS install files to a CD and, make it bootable.

WINDOWS 2000

Create a new directory on your hard drive (for this exercise we'll call it c:\win2000cd) and copy the contents of the

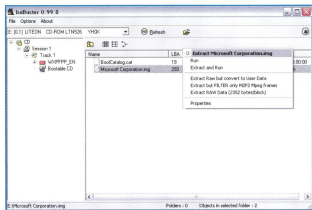
```
C:\WIN00\System32\cmd.exe
C:\>cd sp3
C:\sp3>update
C:\sp3\update>dir
Volume in drive C is BigDne
Volume Serial Number is 2C0F-E86B

Directory of C:\sp3\update

21/10/2002 12:46 PM    <DIR>          .
21/10/2002 12:46 PM    <DIR>          ..
21/10/2002 09:41 PM    13,474  setup.exe
21/10/2002 08:13 AM    425,254  SP3_001
21/10/2002 09:11 PM    17,928  spsetupm.dll
21/10/2002 09:25 PM    368,960  update.exe
21/10/2002 03:59 AM    319,715  update.inf
21/10/2002 08:12 PM    95,776  update.msi
21/10/2002 06:23 AM    84,081  update.ver
                7 File(s)      1,297,638 bytes
                2 Dir(s)      28,445,087,872 bytes free

C:\sp3\update>update /s:c:\sp3cd\
```

Command line switch: once the Service Pack has been downloaded, simply extract the files and run the update to slipstream the files.



IsoBuster: helps make a bootable Windows CD by including an image file that includes all the necessary hidden and system files.

Windows 2000 CD into it. Check that the directory structure from the Windows 2000 CD is kept intact when copied across, and that the Win2000 folder and Windows 2000 CD are identical in the number and size of files.

Then copy Service Pack 3 for Windows 2000 from this month's cover CD (or download it from www.microsoft.com/windows2000). Get the 125MB network installation version, which should arrive on your hard drive as w2ksp3.exe. Because Windows service packs are cumulative, SP3 includes all the fixes previously rolled into SP1 and SP2. Create a second directory (in this example, called c:\win2000sp3). Launch a command session, make sure you're at the location of the downloaded Service Pack, and type the command:

```
w2ksp3 -x:c:\win2000sp3
```

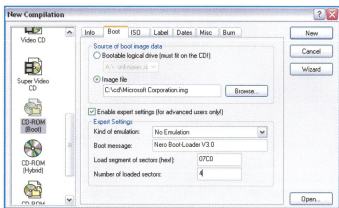
This extracts the contents of SP3 into that folder without running the Service Pack setup file. Move to the c:\win2000sp3\I386\update directory and enter the command:

```
update -s:c:\win2000cd
```

This starts the slipstream process, copying files from the service pack over the top of the Windows 2000 CD files. When the job's done you'll see the confirmation message Integrated install has completed successfully — the win2000cd folder now contains a totally up-to-date copy of Windows 2000.

WINDOWS XP

Create a new directory on your hard drive (we've called it c:\winxpcd) and copy the contents of the Windows XP install disc into it. Check that the folder and CD are the same size, with an identical number of files. Copy Service Pack 1 for Windows XP from this



month's cover CD (or download it from www.microsoft.com/windowsxp/downloads). Get the 134MB network installation version, which should arrive on your hard drive as `xpsp1_en_x386.exe`.

If you use the version from this month's cover CD, you can skip unpacking the files as we've done it for you. If you're working with the network installer, create a directory (we've called it `c:\winxsp1`) to hold the files you're about to extract from SP1. Launch a command session, make sure you're at the location of the Service Pack, and type the command:

```
xpsp1_en_x386 -e
```

In the pop-up window that appears, enter the name of the SP1 target directory (`c:\winxsp1`). When the extraction has finished, drop to DOS, go to that directory (if you are installing from the CD, log to `d:\spack\sp1_en_x86`) and type the command:

```
update /s:c:\winxpcd
```

to slipstream the files.

As before, when the slipstream process is finished, the `winxpcd` folder will contain a copy of Windows XP with the SP1 fix already applied.

MAKING A BOOTABLE CD

With a little extra work you can copy your updated Windows 2000 or Windows XP files to a CD and make it bootable, to further ease the inevitable re-installation process.

Creating a bootable CD is a bit more involved than simply burning files onto a CD. There are certain files that mark a CD as bootable, and these need to be included during the burning process. Of the many CD boot utilities floating around the Net (many of them freeware), we chose IsoBuster (from www.isobuster.com), and included on this month's cover CD).

We like IsoBuster because it contains all the Microsoft boot files in one handy file. Select Bootable CD from IsoBuster's left pane, then click the right mouse button on the Microsoft Corporation.img file in the right pane, and select Extract. This creates a copy of the files needed to mark a Windows install CD as bootable.

For burning the CD we chose the ever-reliable Nero

► **Watch the boot:** pay particular attention when configuring Nero for bootable CDs. All settings must be the same as in the picture.

(from www.nero.com). Click File, New and select CD-ROM (Boot). The options window that appears next is critically important, so be sure you follow our instructions carefully.

One the Boot tab, click on the Image File button and browse to the location of IsoBuster's extracted Microsoft Corporation.img file (you may have to change the Files Of Type selector to All Files to see and select this file).

Under Expert Settings, change Kind of Emulation to No Emulation and set the Number Of Loaded Sectors to 4.

Click the ISO tab and make sure that ISO Level 2 (Maximum of 31 Characters) is selected. Also check the three boxes under the Relax ISO Restrictions section — if your version of Nero has only two selections listed under that heading, you'll need to update to the latest version.

Finally, under the Label tab, set the Volume Label to the same as your original Windows 2000 or Windows XP CD. On our CDs these were W2PSEL_EN and XPFPPE_EN respectively.

Click New, select the folder containing the updated Windows OS files, then drag and drop them into your compilation. Hit the Write CD button and a few minutes later you'll be presented with a slipstreamed, bootable Windows CD. **BTB**

Slipstreaming Office XP

You can also slipstream Office XP, although you'll have to apply Service Pack 1 and 2 separately, as they are not cumulative. First, copy the contents of the Office XP CD to a new directory named `c:\offxpcd`.

Then download both service packs: Service Pack 1 (`oxpsp1.exe`) is 18MB, Service Pack 2 (`oxpsp2.exe`) is 15MB, and you get them both from www.microsoft.com/office/downloads. Create a directory into which each service pack will be extracted: we used `c:\offxsp1` and `c:\offxsp2`.

To extract the Service Pack files, move to the folder containing SP1 and from the command prompt, type:

```
oxpsp1 /c:c:\offxsp1
```

Repeat the process for Service Pack 2, this time typing:

```
oxpsp2 /c:/c:\offxsp2
```

To start the slipstream process, move to the `c:\offxsp1` directory. There are three separate update files here to use. The following commands apply to Office XP Professional; for Office XP Standard, replace 'proplus.msi' with 'std.msi'.

Type the following command:

```
msiexec /p mainsp1.msp /a c:\offxpcd\proplus.msi shortfilenames=true /qb
```

When that's done, enter

```
msiexec /p owc10sp1.msp /a c:\offxpcd\owc10.msi shortfilenames=true /qb
```

That's Service Pack 1 applied to the Office XP install files. Now it's time for Service Pack 2. Change to the `c:\offxsp2` directory and type the following commands:

```
msiexec /p mainsp2.msp /a c:\offxpcd\proplus.msi shortfilenames=true /qb
```

```
msiexec /p owc10sp2.msp /a c:\offxpcd\owc10.msi shortfilenames=true /qb
```

Having completed the slipstream on Office XP, you can burn the contents of the `offxpcd` folder onto a CD: just make sure you set the volume label to be the same as your original Office XP CD.



Perl revisited

Want to make your Web forms more interesting?

Matt Overington shows you how to turn your Web site into an interactive masterpiece.

In last month's *APC* (November, page 168), we covered how to write your first Perl program, and then how to get it working as a Web application. The program only displayed "Hello World" in a browser window, but by now you should have a good idea about how data is passed from your Perl program to the browser. The next important step on the way to building useful Web scripts is to understand how to parse data posted in Web forms. Perl is extremely flexible and powerful when it comes to handling text strings, which makes it a perfect choice for working on form data.

This month, we're going to take data from a Web form and save it into a text file. This could be useful for collecting email addresses, or automating subscription to a mailing list. Note there is no security between your script and the browser (and all the data you are working with is unencrypted anyway), so you don't want to send credit card details using this method. It works a treat for plain data, though.

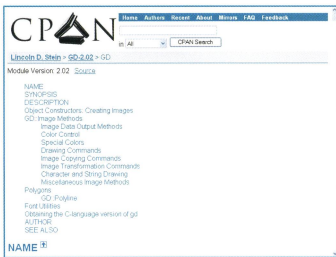
The sample code referred to in this article can be found in the Workshop section of this month's cover CD. We've also included the latest version of Active Perl, so you can get started immediately on honing your code. Open the code in a text window, or better still, print it out, so you can use it as a reference. The remainder of this article refers heavily to the code, and will be hard to follow if you don't have it handy.

THE PLAN

The basic plan for the program is quite simple — display two text boxes in a browser window, take the text entered and save it into variables, then open a text file and add the entered text to the bottom of the file. The program will prompt for an email address and a username and later save them to a text file.

The code begins with the standard line pointing to the location of Perl on the system. This will differ between systems, but we're using Linux here, and Perl is installed in its default location `/usr/bin/perl`. After the header, the first thing that comes to your attention is the `require 'cgi-lib.pl'`; line. `cgi-lib.pl` is a Perl module that contains a range of functions that are useful for working on form data.

The `require` keyword tells Perl to refer to that module file when looking for functions. `Cgi-lib.pl`'s home is www.cpan.org, but we've included it in the Workshop section of the cover CD so you don't need to worry about downloading it. Bear in mind that there are countless handy Perl code libraries around for you to use. Have a look



► *Pearls of wisdom:* the CPAN archive contains an enormous number of Perl modules that you can leverage in your programs.

around the CPAN archives; there's a good chance that the file-handling code you're losing sleep over has already been written, debugged and perfected by someone else.

READPARSE

The next thing to take note of is the `ReadParse(*in)` command. Pay attention to capitalisation, as Perl is case sensitive. The `ReadParse(*in)` keyword grabs all the data that was sent by the browser and stores it in a hash table. A hash table is essentially a list of variables that are grouped together. It consists of a key (which is a string) and a value. Generally you have to put your key in quotation marks, but if it's only one word, this isn't necessary. Hash tables are generally prefixed with a % character.

The real guts of our program begins when we display a prompt on the screen for the user to enter their email address. The following lines display the prompt and take the data from the HTML page via the standard GET method:

```
print "<FORM method=get><Input type=text name=email>
Enter your email address<BR>\n";
```

```
print "<INPUT type=text name=name> NAME<BR>\n";
```

```
print "<INPUT type=submit></FORM></BODY></HTML>";
```

The line that reads `<Input type=text name=email>` is of special importance. When the user running the script enters his/her email address into the text box, it is stored under the variable "email". This is then moved in the hash table when

the `ReadParse(*in)` command is executed. The `$email = $in(email)` command takes the email address from the Web form and assigns it to the `$email` variable. You can work on this data later if you need to, but for the purposes of our program, we just need the raw form data (now `$email`). The same basic code is repeated to grab the name of the user visiting the site using the variable `$name`.

TURNING IT INTO A TEXT FILE

The final step is to write the data that you've grabbed from your Web form into a text file. Of course, you can add extra HTML formatting if you would like to make your output look pretty. The `open (AFILE, ">>address.txt")` command opens up the file `address.txt` and assigns it to `AFILE`. You can also use a Web path and write to an HTML file. The file will be referred to as `AFILE` while it is open. You can open multiple files at once, and probably think of more imaginative names for your variables!


The double `>` in the line indicates that you are appending to the file as opposed to overwriting it. If we had used a single `>` symbol, the file would have been rewritten. From here you can send the data to the text file using the humble `print` command and directing the output to the file. This is achieved by the line:

```
print AFILE "$name $email\n";
```

After you've finished writing the data to the end of the file, you have to close it with the `close` command. This will make all the changes to the file permanent. The file can later be downloaded or referenced online. If you're running a small Web site and you're looking to add names to a mailing list, you can maintain your subscriber list automatically without having to manually add addresses. Removing email addresses is a little bit trickier.

Any Linux user with knowledge of the `grep` command will be able to think of ways to search through a text file and remove specific text, but doing it with Perl is a bit harder. If you thirst for more information, go over to <http://www.ebb.org/PickingUpPerl/pickingUpPerl.html> and take a look at Bradley Kuhn's "Picking Up Perl".

Immediately it should be obvious how to parse an entire page full of form data and save it to a file. If you're after further brain exercises, try to use this method to add a "user comments" link to the bottom of a Web page. Clicking on the link would open up a page with some large text boxes to enter name, email address and comments. The data could then be formatted and saved into the bottom of a HTML document that is live on the site. Visitors could add comments and then immediately view their changes online.

You can now see why many think Perl is the Web programmer's Swiss army knife. 

Handy functions from CPAN

One of the benefits of Perl is that it has a lively online community of programmers who submit code to online resources. Countless handy code libraries can be found at CPAN (www.cpan.org) to help you perform file operations, graphics manipulations, and virtually any other task imaginable. Here are a few of the most useful (all can be found on the CD).

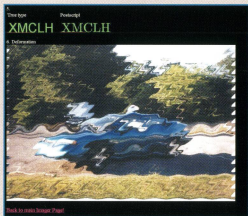
Tk The Tk module is used for adding a GUI to Perl programs. This is more widely used under Linux than any other platform, largely because better GUI construction tools already exist for the Mac and Windows environments. It is quite arduous to use, but many Linux applications are living proof of the power of Tk.

Gd The graphics design module for Perl. This enables you to work on and even generate your own Web graphics using Perl! One of the most handy uses for the `gd` module is adding watermark graphics to Web images.

LWP The World Wide Web library for Perl. This is extremely useful for posting data to and from Web pages and closing off access to certain pages based on passwords. It provides a wide range of high-level functions for Web programmers and is one of the most-used libraries.

NPRG NPRG is a printer module that is specifically designed for Windows 32 and Perl 5.6. It gives a number of high-end printing functions that can be used to create professional-level reports and graphs.

Imager The Imager module can be used to manipulate image files. You can load, edit and save a variety of image files, in a range of colour depths and resolutions. It's especially useful if you want to blend, merge or filter multiple images into a single output.



True printing with CSS

CSS lets you design Web pages that print on paper almost as accurately as they display from the screen. *Steven Noble* explains.

One of the best print-friendly features of CSS (Cascading Style Sheets) is that they allow you to automatically format your Web page using one style sheet whenever visitors view it on their screen, and with another whenever they print it.

The code to do this is very simple. If you prefer the `<link>` tag, place the following in the `<head>` area of your HTML:

```
<link rel="stylesheet" href="name_of_screen_styles.css"
type="text/css" media="screen">
<link rel="stylesheet" href="name_of_print_styles.css"
type="text/css" media="print">
```

If you favour the `@import` method, try this code instead:

```
<style type="text/css">
<!--
@import url(name_of_screen_styles.css) screen;
@import url(name_of_print_styles.css) print;
-->
</style>
```

If you're an intranet developer who can direct everyone in the company to use the same Web browser, then this is all the code you need. A standards-compliant Web browser like Mozilla will automatically toggle between the screen- and print-orientated style sheets, depending on context.

But if you're a Web developer, life is not so simple. Many of the people who visit your site could be using browsers that don't automatically select the right style sheet for each media.

To accommodate the general public, Web developers must still use a server-side scripting language to build print-ready versions of each Web page. But while Web developers cannot rely on CSS alone, they should find that CSS simplifies the task of writing these server-side scripts. Here's how:

First, drop the media attribute from the `<link>` to your screen-orientated style sheet in the ordinary version of your Web page. Next, drop the `<link>` to the print-orientated style sheet altogether. Last, write the server-side script that will generate printer-ready pages for your Web site. If this script grabs the ordinary version of each Web page and feeds it into a string variable to create the printer-friendly version of the page, then it would take just one line of PHP code to modify the `<link>` so that it points to your print-orientated style sheet:

```
Soutput string = str replace ("name of screen stylesheet.css",
```

[illegible]

```
"name of print stylesheet.css", $input string):
```

PRINT STYLE MAKEOVER

At this point, your print-orientated style sheet is just an empty file, and your printouts will be formatted as “vanilla” HTML. This is better than printing Web designs straight off the screen, as common Web effects like white-on-black text will chew through printer cartridges and be near-impossible to read when the ink starts to bleed. But let’s go one better than vanilla HTML, and bring some paper-friendly pizzazz to your print-orientated style sheet.

Start with the font-family property. In all likelihood, your screen-orientated style sheet specified typefaces that are designed for comfortable reading onscreen. By contrast, your print-orientated style sheet can specify any fonts you please. Just remember to provide a few alternatives, for users who don't have your favourites on their computers.

h1 (font-family: 'lucida grande', 'gill sans', arial, sans-serif;)

If you specified absolute (rather than relative) font sizes in your style sheet, then you used pixels as a unit of measurement. But there are no pixels on paper, so use points instead:

► **Drop dead gorgeous:** a drop cap is added to the first paragraph.

p {font-size: 12pt;}

You can't click on a hyperlink in a printout, so highlighting them with blue and underlines would simply be distracting. Make your hyperlinks look like regular paragraph text by adding this rule to your print-orientated style sheet:

a {text-decoration: none; color: black;}

The CSS spec defines an **after** pseudo-element and a **content** property that you can use to automatically print the URL in brackets after each hyperlink, like this:

a:after {content: " (" attr(href) ");" }

However, many Web browsers do not support these abilities at present. If you're an intranet developer who can direct all employees to use a standards-compliant browser like Mozilla, this is not a problem. If you're a Web developer who really wants to emulate this effect, you'll have to write yourself a server-side script.

first-letter is another CSS pseudo-element that could come in handy when formatting Web printouts. The following code will create a "drop cap" after each major heading:

```
h1 + p:first-letter {
    font-size: 250%;
    font-weight: bold;
    float: left;
    padding-right: 2pt; }
```

The **h1 + p:first-letter** selector refers to the first letter of any paragraph <p> that immediately follows an <h1> headline.

The **font-size: 250%;** declaration increases the first letter to 250% of the size of ordinary <p> text, so it displaces but doesn't completely fill three lines. That is, there will be some room between the bottom of the drop cap and the top of the fourth line of the paragraph.

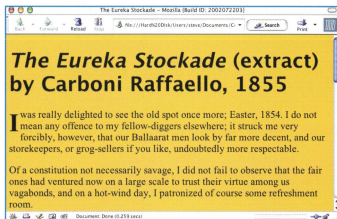
The **padding-right: 2pt;** declaration puts a space between the drop cap and the first three lines that sit to its right.

float: left; floats the drop cap to the left of the paragraph, so the top of the drop cap aligns with the top of the paragraph. Without it, the bottom of the first line of paragraph text would extend from the bottom of the drop cap.

DEALING WITH IMAGES

Automatically removing all images from a printout using CSS is as easy as everything else we've tried so far. Just add this rule to your print-orientated style sheet:

img {display: none;}



It is also possible to use CSS to insert new, print-friendly images into your printouts, but that requires a well-structured HTML document plus a Web browser that provides exceptional support for Web standards. CSS fanatics can attempt this by giving an **url** value to the **content** property of an **after** or **before** pseudo-element (see www.w3.org/TR/REC-CSS2/generate.html#before-after-content). The rest of us will find it easier — and more cross-browser compatible — to write a server-side script that grabs the ordinary version of each page, feeds it into a string variable, and modifies the string for print. If all your attributes like height and width are in your CSS style sheet rather than your HTML proper, then the PHP code that will swap your images could be this simple:

```
$output = str_replace('name_of_screen_image', 'name_of_print_alternative', $input);
```

Or, to remove every image from the string variable, you could use this line of PHP:

```
$output = eregi_replace('<img[>]*>', '', $input);
```

In this example, PHP's **ereg_replace()** function will search a string (\$input) for every instance of the first regular expression ('<img[>]*>') and replace it with the second (''). The first regex will match every instance of , followed by any number of characters that are not >, followed by >. The second regex is empty, so **ereg_replace()** will delete every string that matches the first regex.

PRECISE PAGE SIZES

CSS allows for strict control over the size, shape and margins of the printed page. At the centre of these controls is CSS's page model, including the concept of the page box. The page model differs from the box model (which CSS uses for onscreen display) because a page has finite edge — a printer cannot simply extend a sheet of paper whenever a GIF bleeds off the edges.

While the page has a finite height and width, there does not have to be a direct relationship between the dimensions of the page box and those of the final sheet of paper. For example, both double-sided and two-up printing involve mapping two page boxes to a single sheet. If you feel it's important to set the height, width and margins for your

printouts, use the `@page` selector. Here is how you would use it to restrict the page box to the size of one A4 sheet of paper:

```
@page (size: 210mm 297mm;)  
This is the equivalent rule for US Letter:  
@page (size: 8.5in 11in;)
```

US Letter is wider (216mm) and shorter (279mm) than A4, so here's a page box that will fit on paper of either size:

```
@page (size: 210mm 279mm;)
```

Note that millimetres and inches are the measurement, as we're designing our Web site for print, not onscreen viewing. To describe your page box in more general terms, try "landscape" or "portrait" as the value of the size property.

When developing for a corporate intranet where you can control the printer, the paper size and the Web browser, you can use the `@page` selector to exercise more control. For example, if you require double-sided printing with wide centre margins for ring binders, add these two rules to your style sheet:

```
@page :left {  
    margin-left: 4.5cm;  
    margin-right: 2.5cm;}  
  
@page :right {  
    margin-left: 2.5cm;  
    margin-right: 4.5cm;}
```

The inner margin will now be 4.5cm, and the outer margin 2.5cm. You can even add extravagant, 6cm margins to the first page with the `first` pseudo-element (which overrides the `left` and `right` pseudo-elements used above). Try this:

```
@page :first (margin: 6cm;)
```

A practical application of these abilities would be to ensure that extra-wide diagrams fit on the page, even when the document is printed in portrait mode. The first step is to assign every diagram to a class that you created for this purpose (here, we've called the class `wide`).

Then, give the same name (here, that's `turntofit`) to every page that includes an image of that class. Here's the CSS:

```
img.wide (page: turntofit;)
```

Now, simply rotate all pages called `turntofit`:

```
@page turntofit (size: landscape;)
```

PERFECT POSITIONING

CSS positioning allows you to disrupt the normal top-to-bottom flow of the text in a Web page (see APC November, page 125).

You can use CSS positioning with a print-oriented style

sheet's page model much as you would use it with a screen-oriented style sheet's box model. For example, you can modify an image's float and z-index properties to use it as a watermark on every page of a printout. But generally it's best to use CSS's paged media attributes to fine-tune printouts, instead.

Not only do these attributes retain the expected top-to-bottom flow of a printout, but they focus squarely on the one thing that matters most when printing long documents: where to put the page breaks. For example, you probably don't want your major headlines to break over two pages, or to sit at the bottom of any page of your printout. So, add the following rule to your print-orientated style sheet:


```
h1 {  
    page-break-inside: avoid;  
    page-break-after: avoid;}
```

In fact, it would be best if your major headlines did not even come near the bottom of the page. A few dangling lines of text at the bottom of a page are called "orphans". To avoid them add these rules to your print-orientated style sheet:

```
h1 (page-break-before: always;)  
h2 + p (orphans: 2;)
```

This tells the Web browser to always start a new line before a `<h1>` headline, and to avoid printing two or fewer lines at the bottom of a page whenever a paragraph of `<p>` text immediately follows an `<h2>` headline.

Also, the page-break and orphan values tell the browser where to avoid page breaks, not where to eliminate them. This is because a print-orientated style sheet can have competing page-layout goals, which the browser must reconcile.

As well as attempting to fulfil every request in the style sheet, the browser will try to avoid page breaks within elements which have borders, and it will try to equalise the lengths of each page not ending with a forced break. 

Moving forward

Web standards, like CSS, are designed to be "forward compatible". In other words, if you design a Web site today using CSS2, it will display correctly when the CSS3 spec is finalised and future Web browsers start to support CSS3. Conversely, when future developers start building Web sites using CSS3, their work will display adequately in today's CSS2 Web browsers. The CSS3-only flourishes will be missing when the site is viewed using today's CSS2 Web browser, but the browsers will not mangle the CSS3 layouts. To see which browsers support which print-related aspects of CSS2 today, consult CodeStyle's list: www.codestyle.org/css/media/print-BrowserSummary.shtml.

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nVidia to the max



Ashok Zaman lets you in on top tweaking tips and some secret settings that really will get your nVidia card sizzling.

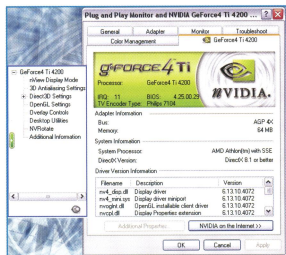
From the original GeForce 256, which revolutionised 3D graphics with its 256-bit rendering capability and on-chip transform and lighting, to the 32-bit TNT2 and the turbo-charged GeForce4 Ti4600, nVidia has long made the hottest video cards on the block.

It enjoys an unbeatable sweet mixture of image-enhancing features and raw 3D clout. But with a little know-how and some software helpers you can unlock even more graphics grunt from your nVidia card.

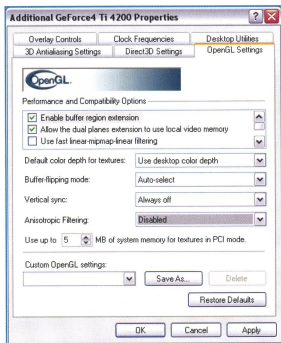
DETONATE YOUR PC

Practically all nVidia cards use a single reference driver, which nVidia terms the Detonator series. It's incredible how much performance can be wrung out of the hardware each time its reference drivers are updated, even without extra tweaking.

So start by grabbing the latest Detonator from www.nvidia.com. This applies not only if you're running older Detonators, but also if you're using drivers provided by the manufacturer of your nVidia-powered card. At the time of writing the latest Detonator driver was the Detonator 4, version 30.82. However, if you don't mind trying a beta driver, the Detonator 40 version 40.71 beta packs a host of extra settings such as dual display mode and NVRotate for full-screen portrait views. We installed it on our test bench system without a hitch.



▶ **Extra settings:** the interface for the Detonator 40, 40.72 beta driver.



▶ **Buffer:** set Vertical Sync to Always off in the OpenGL tab.

Also be sure that you've updated to DirectX 8.1 (it's built into Windows XP, and can also be found on this month's cover CD) and have the latest updates for your motherboard. For instance, if your motherboard is based on a VIA chipset, head to www.viaarena.com and fetch the latest 4-in-1 chipset drivers (v4.43 at the time of writing). This will update your motherboard's AGP drivers.

When you've finished your downloads, install DirectX 8.1, update the motherboard drivers (and do any tweaking of the motherboard), then install the Detonator driver.

COOLBITS FOR HOT CARDS

The next step on the path to pixel pumpin' power is to grab CoolBits. This is a hack for the Windows Registry, which adds a single item to an NVtweak key. This exposes a set of hidden features programmed into the Detonator driver, including a tab for ramping up the clock speed of the graphics card core and memory.

CoolBits is included on this month's cover CD, and can also be downloaded directly from www.tweak3d.net/tweak/geforce/coolbits.reg. Once CoolBits is installed, it's time for some tweaking action. Our test machine runs a GeForce4 Ti4200 64MB, and while driver options will vary between different cards, most of the options discussed here should be available on all nVidia cards.

► **Overclock:** the Frequency settings tab, primed for action.

First, right-click the desktop and select Properties (or open the Control Panel's Display applet). Click the Settings tab, then the Advanced button, and the tab with the name of your card.

You'll see a summary of the card's attributes, and a listing of driver files and version names. Click Additional properties to see a set of tabs that includes the all-important Clock frequencies option.

Before you head into that tempting territory, click on the OpenGL tab (for the time being, ignore image enhancement features like anti-aliasing and anisotropic filtering, which are great but can incur big performance hits).

Vertical Sync synchronises the frame buffer with your monitor's refresh rate potentially limiting maximum performance — disable this by selecting Always Off.

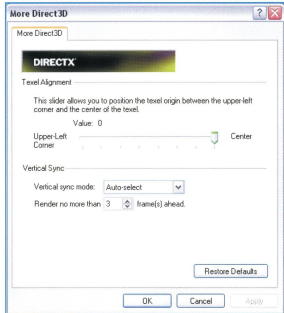
The same option for Direct3D is available under the Direct3D tab — go to More Direct3D, and set Vertical Sync to Always Off. Interestingly, the Vertical Sync option in Direct3D is only available with CoolBits.

Now for some overclocking!

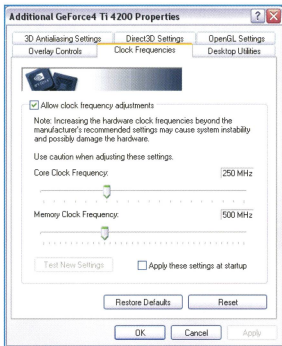
RAMP IT UP

Let's start with the obligatory warning and disclaimer. Overclocking the video card can do nasty things to your card, corrupt your system and void your warranty. If anything goes wrong, it's your problem and no-one else's. (That said, it's unlikely that you will come to grief, and CoolBits tests any changes made to the clock settings before accepting them.)

Click on the Clock Frequencies tab and tick the checkbox Allow Clock Frequency Adjustments. You'll be prompted to restart your PC; after doing so, go back to the Clock Frequencies tab and you'll notice that the sliders are now live.



► **Disabled:** set Vertical Sync to Always off in the Direct3D tab.



The best way to proceed is to bump-up both the core clock and memory in small increments, such as 5MHz at a time. You can use a benchmark like 3DMark2001SE from www.madonion.com or the Unreal Tournament 2003 Demo to test performance increases. As you approach the upper limits of your card's capabilities, you may notice glitches and screen artefacts appearing when running your benchmark or game. That's when it's time to wind it back a little, in 1MHz or 2MHz increments, until it runs glitch-free.

Play around with the settings, measure and compare results. It could well be that you can clock the memory a lot higher than the core, or past a certain point further increases in clock speed actually slow the card down again. It's all about finding the performance sweet spot.


OTHER COOL TOOLS

While CoolBits is one of the best ways to boost your PC's performance, integrating with the drivers without sitting as a memory resident, it's only one of many different alternatives.

Third party utilities such as RivaTuner

(www.majorgeeks.com/article.php?sid=737) or NVMax (www.majorgeeks.com/article.php?sid=387) are excellent tools for overclocking your video card. They also allow you to tweak other low-level system settings available, such as side-band addressing to enable faster data request transmissions across the AGP bus, as well as fixing the monitor refresh rate problem with nVidia graphics cards on Windows 2000 or XP.

When playing games on these operating systems, the refresh rate changes from that specified for the desktop, reverting to an annoying and flickery 60Hz. While individual fixes for this issue exist, these utilities are one-stop-shops for all your tweaking needs.

The latest beta 40.71 Detonator 40 drivers also address the refresh rate anomaly. 

Getting inside Palm OS 5



Almost two years in the making, Palm's new OS is finally here. Adam Yap examines what's new.

To use a Windows analogy, it's as significant as the leap from Windows 3.1 to Windows 95. For Apple enthusiasts with longer memories, think of the shift from Motorola's 68000 chips to the PowerPC family. These parallels give you an idea of the magnitude of Palm's new operating system. Palm OS 5 is about faster chips, a totally new processor architecture, plus native support for everything from multimedia and Net access to security and wireless networking.

So exactly what does Palm OS 5 have up its sleeve? What makes it tick, and what does it mean for today's applications and tomorrow's handhelds?

THE LAST DRAGONBALL

After almost a decade wedded to Motorola's nimble DragonBall 68000-series processors, the Palm OS moves to a new CPU platform that is capable of driving multimedia and communications applications.

Palm OS 5 uses as its engine the ARM architecture, designed by Advanced RISC Machines and licensed to several chip makers. These include Intel — whose XScale family is the chip of choice for Pocket PC handhelds. It also drives the new Sony NX60 and NX70V Palm OS models, as well as Texas Instruments, whose OMAP processor powers the new Palm Tungsten (see review in this issue's On Test section).

Hoping not to lose its primacy in the Palm processor kingdom, Motorola will produce the ARM-compliant DragonBall MX1. ARM chips can clock up to 1GHz, although the sweet spot in terms of price, performance and battery life currently lies in the 200-400MHz range. Contrast this to the DragonBall 68000-series, which currently tops out at 66MHz.

It's about more than just megahertz though. The ARM family's frugal MIPS (Million of Instructions Per Second) per watt ratio should safeguard the Palm's reputation for long battery life. And the ARM architecture lends itself to

easier customisation by hardware manufacturers, as such can now expect processors and handhelds differentiating themselves with built-in wireless, telephony and multimedia functionality.

Palm OS 5 also paves the way for dedicated graphics chips, with ATI signing up to supply an Imageon chipset with accelerated 2D graphics and hardware-based MPEG 4 decoding.

AN INTERFACELIFT

On the outside, the changes to Palm OS 5 are less radical. PalmSource (the Palm spin-off which produces the OS and licenses it to hardware manufacturers) has wisely retained the elegant simplicity of the Palm interface.

The most noticeable difference in a Palm is the high-density display. Gone is the former restriction to blocky 160 x 160 screens; Palm OS 5 supports resolutions in multiples of 160 x 160.

The first Palm OS 5 devices sport 320 x 320 displays that, although being the same physical size as the classic Palm handheld, offer four times the resolution of a 160 x 160 panel. This equates to richer colour in everything from icons to photographs, and smoother text.

Higher resolutions, such as 480 x 480 and 640 x 640, open the possibility of physically larger displays and hardware form factors, from a Filofax-sized device to a mini-notebook. (While the high resolution displays of the Sony CLIE handhelds have already hit 320 x 320, they do so by working around the limitations of OS 4 rather than employing the hi-res display API in OS 5; this means that an application which runs in the CLIE's hi-res mode won't necessarily have the same glam look under OS 5.)

Palm OS 5 also sees the end of the characteristic Palm beep, replacing it with a new Sound Manager API that can play and record sampled 16-bit stereo sound. The Palm Tungsten uses this for voice memos, while Sony has taken it a step further to include MP3 playback.

WELL CONNECTED AND SAFE

OS 5 introduces more streamlined support for wireless networking technologies like 802.11b and Bluetooth. These networking standards are built into the OS rather than requiring developers to write their own drivers and utilities, a move certain to spur an increase in wireless Palm peripherals.

To take advantage of this, new additions to the OS include a Web browser capable of handling full-sized Web pages



► **Looking good:** Palm OS 5's high density display offers four times the resolution of OS 4 in the same physical space.

OS 4 still lives

With all the hype over OS 5 and ARM chips, it's important to remember that OS 4.x and the 68000 family of processors are still very much alive. The first model in the mass-market Zire fleet runs the familiar combo of Palm OS 4.1 on a 16MHz DragonBall chip, and others are sure to follow in its built-to-a-budget footsteps. PalmSource has indicated that OS 4 will not only continue for the time being, but that it may even pick up some of the new features of OS 5 such as high-density displays.

Spoil yourself with colours



10/10

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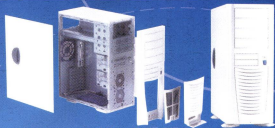
Good Quality, Excellent
Cases.



COLOUR CASE - Champion Series (Wireless Keyboard and Mouse, Display panel Optional)

Server Quality in Mini Tower Cases - Review on Casesjunkies.com.au.

There is a numerous feature on the Galaxy II that shows the detail and functionality expected in a Server Quality case.



Galaxy II

Air Filter / Front Access USB/Audio



KA-68G7

Front Access USB



KA-V30

Micro ATX

Front Access USB/Audio

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KA-731 P4CD

Micro ATX

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SR-103

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instead of cut-down wireless versions.

Security is another area that came under the spotlight when developing OS 5. Aimed squarely at the corporate sector, new security APIs introduce system-wide 128-bit strong RSA encryption to secure data in case of loss or non-authorized use of the Palm device. There's also support for new authentication methods such as biometric verification and smart cards.

Palm OS 5 licensees also have the option of including VPN software with their devices, which should help make inroads into the enterprise market currently dominated by Pocket PC.

BUT WILL MY APPS RUN?

Perhaps the most important feature of OS 5 is its backward compatibility with OS 4. There was never any question that the ability to run the thousands of OS 4 apps under OS 5 would be absolutely vital in keeping the fans faithful. How PalmSource accomplished this is both an impressive feat of programming and a lesson in compromise.

The architecture of Palm OS 5 is built in different layers, with the physical hardware as the foundation. In the middle sits the OS itself, with additional libraries the OS licensees choose to add for extra functionality.

Sandwiched between the OS layer and the physical hardware are the device and hardware abstraction layers (DAL and HAL). These tell the OS what features the handheld has and how to access them. They're particularly important because of all the potential differences in hardware configurations available to Palm OS 5 licensees, regardless of whether the device has built-in Wi-Fi or doubles as a mobile phone, the OS remains exactly the same.

Sitting above the OS is PACE (the Palm Application Compatibility Environment). PACE duplicates the behaviour of a 68000 processor, allowing OS 4 apps to run under OS 5. However, this isn't emulation — a process which is typically inefficient and slow. PACE translates the API calls of an OS 4 app into a format that the ARM chip can understand, so that they're executed as if they were native OS 5 apps.

Most applications spend the majority of their execution time within the API, which handles things like drawing to the screen and reading and writing data, so the speed boosts are substantial. This lets OS 4 applets make best use of the ARM chip's processing power.

PalmSource estimates that most applications will run at least three times faster on an OS 5 device than on an OS 4 device. The exceptions to this rule would be those applications which spend a great deal of time outside the API, perhaps implementing an intensive algorithm. In these rare cases, the 68000 instructions would have to be emulated, which means that such applications could run slower on an OS 5 device than under OS 4. One example is games that implement their own high-speed drawing routines rather than using OS 4's native API calls.

For high performance outside the API, Palm has provided a method to write native ARM code (called ARMlets) in Palm OS 5 application. ARMlets completely bypass PACE, giving a direct pipeline to the chip's raw processing power.

The downside of not completely emulating the OS is that only "well behaved" applications are guaranteed to work

Applications

PACE: Palm Application Compatibility Environment

Licensee Libraries

Core Palm OS

DAL: Device Abstraction Layer

HAL: Hardware Abstraction Layer

► **Layer upon layer:** the canny construction of Palm OS 5 allows it to run the majority of current Palm applications without emulation.

under PACE. Applications that rely on unsupported data structures or directly access the hardware won't be passed through PACE. Because of this, PalmSource estimates that only 80% of applets that currently work in Palm OS 4 will run without any code modification in OS 5.

Naturally, well-behaved OS 4 apps which make use of ARMlets will run fastest and gleefully tap into everything that OS 5 has to offer. Many mainstream Palm applications are being reworked along these lines for OS 5 — some have already been certified as OS 5 compliant (we won't see "pure" OS 5 apps until PalmSource releases new SDKs).

Compatibility between OS 4 and OS 5 means that developers can release a single application that runs on either OS instead of shipping two processor-dependant builds.

What apps won't run under OS 5? Programs that write to display hardware directly (typically games) and apps which use 68000 assembly code to speed up execution.

The fate of system hacks is a mixed bag. By their very nature, hacks aren't at all "well behaved", and there has been plenty of speculation in the Palm developer community that hacks just won't work in OS 5. In our tests using the Palm OS 5 Simulator (see "Test drive Palm OS 5" below), some hacks worked perfectly while others refused to operate or became unstable. That doesn't mean you'll be forced to live with a boring handheld devoid of the cool tricks and customisations which hacks afford.

OS 5 allows for hack-like applets called notification applications. These allow developers to reproduce hack-like functionality and fun, although the code will need to be rewritten from scratch. **BTB**

Test drive Palm OS 5

It's always a good idea to try before you buy. We can't give away an OS 5 handheld with every issue of APC, but we've done the next best thing: our cover CD includes the official Palm OS 5 simulator. This program contains the real deal, Palm OS 5, compiled as a native Windows app. Load it up and you've got your own virtual Palm OS 5 device sitting on the desktop. When you're prompted to select a ROM image to load, choose NTRFull_enUS.rom. You can install Palm apps and data files by dragging the PRC and PDB files into the Simulator window. This means you can see how all of your favourite Palm OS 4 programs will behave under OS 5.

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Web interfacing with Photoshop



Trevor Morris details how to bring your Web interface to life using ImageReady.

Last month's Workshop (APC November, page 172) demonstrated how to create a tabbed interface in Photoshop. This month the focus is on how to use Photoshop's Web-enabling sibling ImageReady to slice, animate, optimise and export that interface for the Web.

And remember, all PSDs and associated style libraries (ASL) in this workshop, as well as the modified HTML file and optimised Web imagery, are on this month's cover CD.

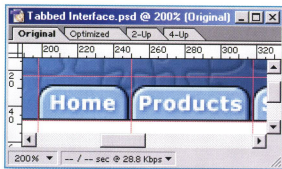
Slice It Up

Begin by opening your PSD from last month's Workshop into ImageReady — or load the PSD on this month's cover CD. The first step to Web-enabling the tabbed interface is to create slices. In order for this interface to "animate" when triggered by an event, such as clicking on it with the mouse button (called an on-click event), it must be divided into individual pieces called slices. For example, clicking on a tab should give the illusion that the tab becomes raised and is brought to the foreground. Therefore, each tab will need to become an individual slice. The remainder of the interface will also be saved out as slices, but may not necessarily animated or trigger an event.

Using guides is a quick and simple way to automate most of the slicing process. Before you begin, here are a couple of guide tips that might help:

- Create guides by dragging them out of the Rulers
- Move an existing guide using the Move tool
- Remove a guide by dragging it back onto the document rulers
- Alt-drag guides to flip their orientation — horizontal to vertical and vice-versa
- Shift-drag guides to have them snap to the ruler increments

While some guides may already be in place from the November's Workshop, it's a good idea to clear them and start from scratch. Place the first horizontal guide at the approximate height where you think the top of a raised tab will be — about five pixels above the default position/state (mine was at Y: 23 px). Add another horizontal guide just



► **Guides:** each tab should be enclosed on all four sides by guides.

below the black line at the base of the tabs. (Y: 48 px in my document.) Then, place a vertical guide adjacent to the left edge of each tab.

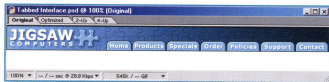
Finally, if you have a large region of empty space where no buttons exist, on the right side of your canvas, add one more vertical guide adjacent to the right side of your last tab. Each tab should now be enclosed on all four sides by guides. Any other guides beyond those mentioned above should be deleted.

From the menus, choose Slices, Create Slices from Guides. Undoubtedly, this command will produce far more slices than required; however, it is much quicker, and simpler, to begin like this and then "clean up the mess". To reduce the number of slices, you'll need to combine all adjacent non-tab slices that share similar characteristics (number of colours, transparency, etc.) — since each slice may only have one optimisation setting.

Choose View, Show, Guides to temporarily hide the guides. Begin by combining the two slices that make up the logo area in the top left. Using the Slice Select tool, select the top left corner slice and then Shift-click on the slice below it (the Shift key is used to select multiple slices). Right-click either of the selected slices and choose Combine Slices (or choose Slices, Combine Slices from the menus).

In the Slice palette, replace the default slice name with "logo" (or some other more meaningful name). Also, you may wish to enter the relative address of your home page into the URL field (e.g. index.html). This is a common practice that provides your visitors with a quick and intuitive way to return to your "main" page. Next, select all of the slices above the tabs, combine them and name the combined slice something like "top" or "header".

Finally, combine the slices in the white content area. However, because this slice will eventually contain text, it's not necessary to name it. Instead, just change the Type to No Image. That looks a lot tidier. Now it's time for the fun stuff — creating the click states.



► **Tabs:** the interface as completed in the first part of this Workshop.



Ensure that both the Rollovers palette and the Slice palette are visible. Select the slice that contains the Home tab and change its name to "home" — either via the Name field in the Slice palette, or by double-clicking on the slice's default name in the Rollovers palette. If you wish, you may also use the URL field (and Target field, if your site uses frames) in the Slice palette to specify the page to be displayed when the tab is clicked (e.g. home.html).

MAKIN' IT CLICK

Click the Create rollover state button at the bottom of the Rollovers palette. By default, this will create an Over State, but since you want a Click State, right-click on the state/slice (in the Rollovers palette) and choose Click from the context menu.

Now you need to define what the click state of this slice will look like. Expand the "HOME" layer set in the Layers palette and select the "Home" type layer. Turn off, or delete, the Drop Shadow effect. Use the Add layer style button at the bottom of the Layers palette to add a Color Overlay effect. Change the colour of the overlay to black (R0,G0,B0) [#000000] using the Layer Options palette. You'll need this style again for the other tab labels, so add it to the Styles palette by clicking the Create new style button at the bottom of the palette: enter "Tab Label - Over" for the name.

Next, select the "home tab" layer. Turn off, or delete, the Bevel and Emboss effect, and then add a Color Overlay using white R255,G255,B255 [#FFFFFF]. Again, add the style to the Styles palette, this time with the name "Tab - Over".

Ensure that both the "Home" type and "home tab" layers are linked together and then use the Move tool to move the layer up by five pixels. To hide the black line at the base of the tab, turn on the "home cover" layer in the "COVERS" set.

Finally, you must adjust the optimisation settings for the slice to ensure that it will look good and download quickly when viewed in a Web browser. In the document window, select the 2-Up view and display the Optimize palette. Use the Zoom tool to magnify the image to about 400%; this will allow you to compare the results of your optimisation settings in the lower/right pane with the Original image in the upper/left pane (labelled Original).

Select the "home" slice in the lower/right pane and then establish the following settings in the Optimize palette: Format: GIF, Lossy: 0, Color Reduction Algorithm: Adaptive, Colors: 64, Dither: None, Transparency: off/unchecked. Feel free to adjust these suggested settings to suit your bandwidth/preference.

To preview the click state within ImageReady, press the Preview Document button: press the Preview in Default Browser button to preview the results in an external browser. Repeat the above procedure for each tab. To recap so you are clear:

► **Slice and dice:** the interface is sliced and ready for animating.

- Select the slice using the Slice Select tool
- Name the slice (and specify the URL and Target frame if you wish)
- Add a new state and change its type to Click
- Apply the "Tab Label - Over" style to the tab label
- Apply the "Tab - Over" style to the associated tab layer
- Assuming the type and tab layers are linked together, move them up five pixels using the Move tool
- Establish the desired optimisation settings for the slice

For the "logo" and "top" slices, use the same optimisation settings as above, however, you may need to use more than 64 colours — try 128 and if that is not sufficient, use 256. There is no need to optimise the "content" slice since it will be rendered as an HTML table cell, not as an image.

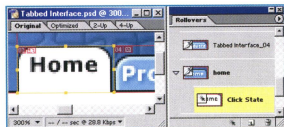
WEB READY

To save the PSD, choose File, Save. To export the Web-ready interface — images and HTML/JavaScript — choose File, Save Optimized As.

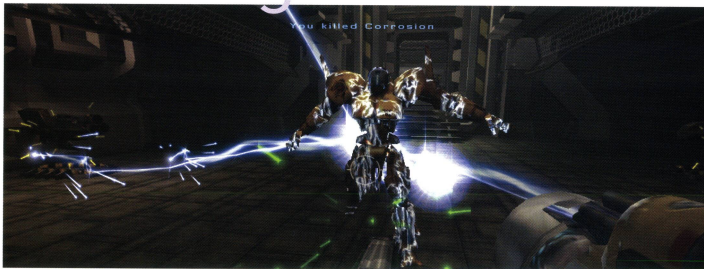
Don't forget to locate the exported HTML file and open it in your preferred browser. Notice how the tabs immediately revert to their default state when you move your mouse off them? That's because of some extra (unavoidable) code that ImageReady insists on including. To correct this behaviour, open the HTML file in an editor and repeat this procedure for each image's anchor tag (<a>...):

- delete the entire line containing the `onclick="..."` statement
- change the `onmouseover="..."` statement to `onclick="..."`
- remove `"return true;"` from the end of the new `onclick="..."` statement
- add a closing delimiter (>) to the end of the new `onclick="..."` statement
- add `"-click"` to name of the GIF that corresponds to the anchor tag being edited. For example, the first anchor tag corresponds to the home image/tab, so you would change `images/home.gif` to `images/home-click.gif` in the new `onclick="..."` statement

Once you've done the above modifications for each tab, save the HTML file and refresh/reload the file in your browser. The tabbed interface is now ready for inclusion into your own personal Web site. [E1112](#)



► **Styles:** make it easy to change the look of each rollover state.



PC

Unreal Tournament 2003

Improvements from earlier versions are readily noticeable with Unreal Tournament 2003. Additions include maps and a game called Bombing Run — which plays like Speedball-meets-capture the flag. Teams attempt to carry a ball into a “goal”. The ball carrier cannot shoot, the fire button merely lets them pass the ball. Unfortunately, the popular Assault mode from UT has been dropped.

Weapons have also been tweaked. A rail-gun-style lightning gun replaces the sniper rifle, while the plasma rifle is now called the link gun (because team-mates can engage in some *Ghostbusters*-style “don’t cross the beams” action).

UT2003 also debuts “Adrenaline”, a counter that increases with the number of kills and “pills” you pick up. When the counter hits 100, different button combinations can be entered to power-up players in a number of different ways, including speed and invisibility.

Single player mode — something in UT that was merely a practice run for multiplayer — has been juiced up with a statistical improvement element. Even so, it’s online and on LAN that UT2003 will get its biggest workout, and the network code seems surprisingly mature.

UT2003’s scalable visuals mean that those who can’t afford high-end video output can still play the game with some semblance of playability. Just don’t expect a very smooth run unless you have a beast of a PC. Running on leading video cards with a decent CPU (2GHz +), the game really does turn on the charm.

The environments are clean, the weapon effects bright, and the visual fidelity has not been compromised in order to provide flowing game play.

The player models look a lot more substantial and “real”, a major shortcoming in prior games. Now the models look like they are interacting with the 3D space, not just skating over it.

Most importantly, the player physics and movement reach new heights, rag-doll physics meaning that realistic reactions to impacts occur, as opposed to seeing the same few responses every time.

Trick moves have been hard-coded into the engine, which does at times make trick jumping forced, but is largely a take it or leave it affair.

Sound effects won’t win any awards, but are beefy enough to grab attention. Surround sound options are supported, if your PC hardware can handle them.

Voice taunts return, but they are repetitive and annoying — there’s only so much testosterone-laden bellowing you can stand.

Unreal Tournament 2003 is a throwback to the days when FPS realism took a back seat to pure speed and adrenaline. Fine aim and sharp reflexes are rewarded, with plenty of tactical awareness not harming your prospects either.

If your interests lie strictly in realism-



► *Grass-tastic:* for high detail, the organic modelling in UT 2003 remains excellent.

based FPS, look elsewhere. However, if you’re a fast deathmatch fan, this is pretty much compulsory buying.

Similarly, if you’re blessed with cutting edge video silicon and plenty of CPU power, you will also find the eye candy factor very appealing.

Online www.unrealtournament2003.com

Price \$89.95

Verdict ●●●●○

Icewind Dale II

Icewind Dale II's adoption of the AD&D Third Edition ruleset should appeal to the hardcore Dungeons and Dragons fans from the IWD fan base.

As featured in the very successful Neverwinter Nights title, the latest version of the rules allows players more flexibility in character creation and development.

Plot development is Icewind Dale II's stumbling point. As with the original Icewind Dale and its expansion, the storyline is strictly linear; it directs players towards the next confrontation or mission.

To compensate, the action comes thick and fast. You'll be hacking and slashing through an increasingly tough rogues gallery. By the end, even the most bloodthirsty players will feel like they've gotten their money's worth of combat, without being too fatigued.

Another unwelcome hangover from the original is the disappointing animation that returns in Icewind Dale II. Even stationary, the Baldur's Gate-style 2D backdrops remain largely non-interactive, and the character figures look bland and lack detail.

What was state of the art years ago now barely makes the grade. If anything, this further signals that IWD II is more for the fans of the series rather than newcomers of the computer RPG experience.

Black Isle Studios may not have wasted too much time revamping the graphics, but one thing they have obviously worked on is the combat AI of your foes. The days of the bad guys stepping up to get slaughtered are over — the enemy in this scenario demonstrates a good dose of situational awareness.

What's even better is that if the beastie that you're facing has an array of magical or special abilities, they will use them to full effect.

While this is still not as good as playing an intelligent human, it's a reasonable facsimile, and will not frustrate those seeking a smarter level of opposition.

Icewind Dale II isn't the kind of title that will reach out and grab the novice gamer. It's difficult, unforgiving at times, and formulaic in execution. But fans of the series know exactly what's on the menu here — lots of combat and



► **Skin deep:** there's nothing shallow about Icewind Dale II's challenge level.

minimal actual "role play".

Icewind Dale II doesn't have the multiplayer brilliance of Neverwinter Nights, or the lush visuals and spellbinding plot of Morrowind. However, for old school hack and slashers, it does have a charm of its own.

Online <http://icewind2.blackisle.com>

Price \$89.95

Verdict ●●●○

Links: 2003

The Links series is one of the oldest franchises in gaming, and yet despite being around prior to the 386, the formula hasn't changed. As usual, the latest iteration has been given a good tweaking, some new faces, and some new courses, but no major changes are evident.

Links 2003 sees the introduction of two extra swing mechanisms — Powerstroke and Real Time Swing — which rely on moving the mouse to emulate the club's motion. It's a good gimmick, but one that wears thin after an hour. Links veterans and newcomers alike soon revert to the "classic" swing technique. Disappointingly, this and the introduction of 3D golfers are the most noticeable innovations in Links 2003.

In an age where every game seems to be going 3D, Links 2003 still uses the same painful rendering process that has been the trademark of the series since day one. Fluff your shot forward a few inches and watch as the game redraws your position from scratch.

In play, a couple of showstopper bugs required an ALT + F4 exit from the game to get back to the desktop. In a game with code this mature, that's a major concern.

Even with these problems, playing the game helps you understand why the Links series still holds such appeal. Microsoft Game Studios have incorporated improved matchmaking services in the game, to make organising those online clashes easier. The courses provided are hardly household names. Cabo del Sol in Mexico, Gleneagles in Scotland, New Zealand's Kauri Cliffs, The Tribute, and Cambrian Ridge, both in the USA, and Skeleton Island, a fantasy course situated off the coast of Africa.

Finding new, worthy courses to serve up to players each year is obviously a hard ask when you've been around as long as the Links series. Perhaps it's time to break out some of the past big names and give them a more modern treatment. This would be easier to justify if the game engine was rebuilt. If this isn't going to happen, at least throw Links players a bone and offer them free downloads of popular past courses. No matter how much of a hidden gem some of the new courses are, toiling in obscurity is hardly the stuff pro golfing fantasies are made of.

New high resolution visuals help keep the



► **Leader-bored:** Links 2003 looks like an oil painting. Static scenes mean there's about as much animation as one, too.

game looking good, albeit very static. And while some familiar faces appear, Tiger Woods is not one of them. He does however endorse it.

Links 2003's lack of innovation means that unless you haven't played a Links game for ages, it might be better to check out the competition.

Online www.microsoft.com/games/links2003

Price \$99.95

Verdict ●●●○

No One Lives Forever 2

With a psychedelic retro setting, a female lead character and a wry sense of humour, NOLF is proving a surprise hit. NOLF 2 keeps the heroine and the humour, improves the visuals, and shows there's life yet in single player FPS.

Playing as über spy-chick Cate Archer, once more you're put into harness to stop dastardly foes H.A.R.M. from causing nuclear war. Some of the biggest niggles from the first game have been remedied as you move through. The urge to spell out every minute detail via cut scenes has been thankfully avoided, and interruptions to playing time are greatly reduced.

One of the best things about NOLF 2 is the abilities system. Completing extra objectives and achieving goals beyond blasting straight through the game sees you being allocated increased skill points to devote to different areas of proficiency. This allows a level of customisation and ownership of "your" character, even if she remains within the boundaries of the script.

Unfortunately, one of the biggest issues from the past remains. You can stealthily shoot

down a bad guy, and his companions will remain oblivious to the fact that something's amiss. Yes, they will notice that the soldier is down, and will then hang in the proximity until you render them the same favour. This glaring hole in the AI is a persistent issue, and proves to be an annoying and easily exploited flaw.

But the biggest disappointment about NOLF2 to many will be the bare bones multiplayer on offer. Much like the first title, the bulk of the development effort has been concentrated on offering a fantastic single player experience. Apart from cooperative play, which is rewarding, there is nothing else on offer. If the code is there, why not exploit it further? Some team-based deathmatches in the sharply detailed locales would go down a treat.

NOLF2 certainly delivers on the promise of the original, and shows that when it comes to single player FPS, developer Monolith is at the top of the heap. But while the new story, updated graphics and skill system are all fantastic additions, more could have been



► **Eye spy:** toned down cut scenes mean more action and less talk.

done. Less emphasis on "hunt and fetch" missions, boosted enemy AI and above all, more multiplayer options could have made this good effort brilliant.

Online <http://nolf2.sierra.com/>

Price \$89.95

Verdict ●●●●●

XBOX/PS2/GAMECUBE

Tony Hawk Pro Skater 4

With an incremental refinement of its predecessor's graphics, the focus was always going to be on how Tony Hawk's fourth game played rather than how it looked. Developer Neversoft has risen to the occasion.

Larger game levels, the scrapping of the timer for all but specific challenges, and the freedom to explore all work in the game's favour. There are new tricks and moves, but the emphasis really has moved to capturing the freedom of skating. The multiplayer focus has been pared back, but the changes made to single player mode compensate.

Online www.activision2.com/tony_hawk/

Price \$99.95

Verdict ●●●●●



► **Standing room:** Tony Hawk 4's huge levels encourage exploration.

PS2

Tekken 4

With gloriously detailed models and lighting, and support for progressive scan output, Tekken 4 certainly looks like the PS2 fighting champ. Sadly, limited depth and complexity mean that for owners of earlier titles, gameplay hasn't advanced at the rate of the visuals.

Apart from eye candy, very little change is evident — a few new characters and interactive scenery is about it. Even extra features are hard to find.

A victim of its own success, the slightly complacent Tekken 4 surpasses all competition but the most important — Virtua Fighter 4.

Online www.tekken4.com

Price \$89.95

Verdict ●●●●●



► **Face off:** Tekken 4 falls short of Virtua Fighter 4.

XBOX

Blade 2

From the movie starring a wooden Wesley Snipes comes a game starring... a woodenly animated model of Wesley Snipes. Blade 2 requires you to beat seven shades of hell out of a group of vampires straight from gaming's B-grade central casting.

The 360 degree combat feature is underdone, and the controls are counter-intuitive. You have a sword strapped to your back, yet you have to build up your "rage" meter to even use it. What would have been great a year or two ago (before the Xbox was made!) barely passes muster now.

Online www.blade2game.com

Price \$99.95

Verdict ●●●○○



► **Clone war:** Blade 2's play is too generic.

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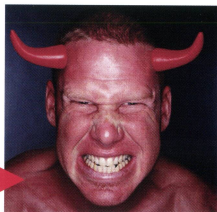


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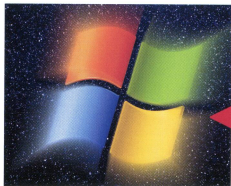
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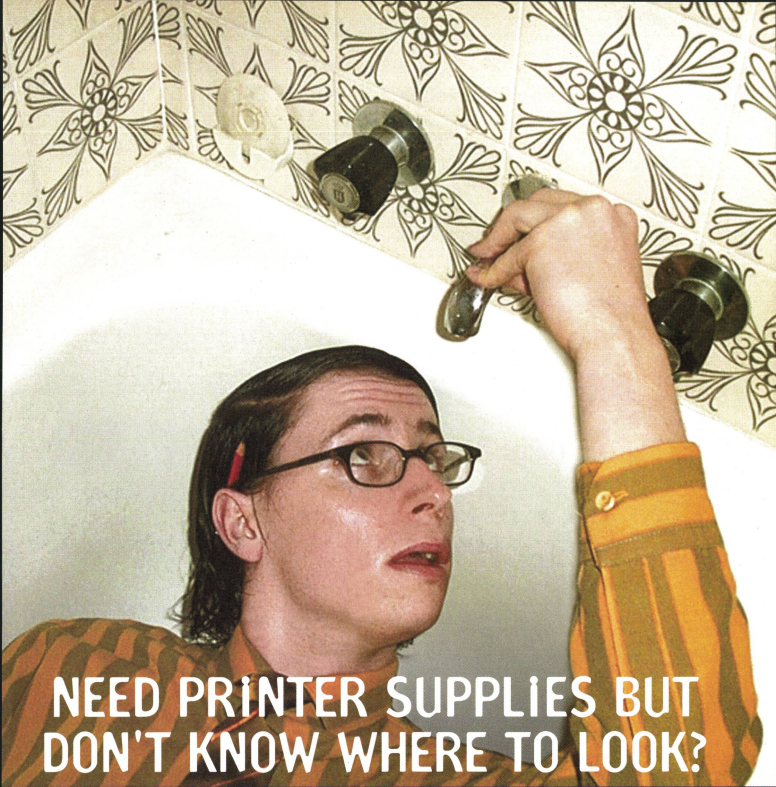
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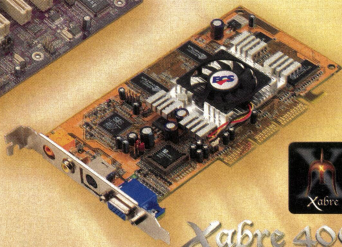
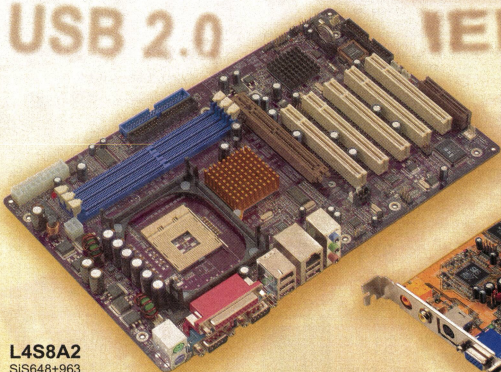
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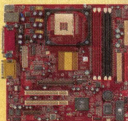


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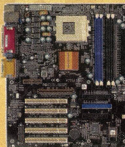
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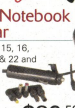


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CANON BJC-3000/6000/8000 Series	3x8	47-CLR
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HP Colour Desk Jet 600C/660C/690C Series & Olivetti!	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
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EPSON Stylus 820/colour II/its	3x12	24-CLR
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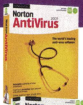
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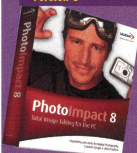


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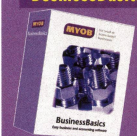
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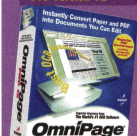
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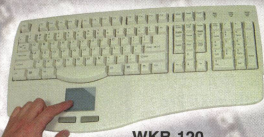


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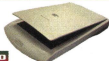
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- * Integrated video
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- * 15" Refurb Monitor



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- * 128MB RAM
- * 20 GB Hard Drive
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- * Integrated Sound
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- * 50 GB HDD * FDD
- * DVD Rom
- * CD Re Writer
- * Integrated Sound
- * Active Lancing speaker system with subwoofer
- * 64 MB GeForce 2 video
- * 56K Modem
- * 17" Refurb Monitor
- * Optical Mouse
- * Deluxe Keyboard



IBM Think Pad 600E \$1699

- * Pentium II 366MHz CPU
- * 10GB Hard Disk Drive
- * 128MB RAM
- * DVD ROM Drive
- * 13.3" (TFT matrix) Screen
- * Stereo Sound
- * 56K Internal Modem
- * External Floppy drive
- * Lithium Ion Battery
- * Carrying case



Acer Travelmate 520i \$1799

- * Celeron 550MHz CPU
- * 4.8GB Hard Drive
- * 8MB AGP Graphics
- * 120MB RAM
- * 24x CD-Rom
- * 1.44MB Floppy Drive
- * 56K Modem (Built-in)
- * 10/100 NIC (Built-in)
- * Lithium Ion Battery
- * Acer Brand Carry Case



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- 40x12x40 CD-RW
- 16x DVD-ROM (48x CD-ROM)
- Samsung 955DF 19" Flat Screen Monitor
- 5.1 Sound Card
- Internet Keyboard & PS/2 Mouse
- Creative Inspire 4400 Speakers
- 10/100 Mbit Network Card
- 2 x 80mm BLUE LED Case Fans ...Blue Fusion!
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- MS WINDOWS XP Home
- 2-year warranty
- **Rated 4/5 in APC's November PC Megatest**

RRP **\$3750.00**



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features and brilliant performance" - PC Authority Sept 2002

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- Intel® Pentium® 4 processor 2.53 GHz
- 256MB PC-2700 (333MHz) DDR RAM
- 80GB 7200 rpm Hard Drive
- X-Micro 128MB GeForce 4 Ti 4200 Videocard
- 40x12x40 CD-RW
- Samsung 753DFX 17" Flat Screen Monitor
- Internet Keyboard & PS/2 Mouse
- Creative Inspire 4400 Speakers
- 56K Modem, 1.44 FDD
- MS WINDOWS XP Home
- 2-year warranty
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product id: 66844

\$245

Adobe Acrobat



Adobe Acrobat 5.0

Convert docs to PDF's to share over the web. Easy as a click in Microsoft Office Toolbar (Windows Only). Anyone can open your PDF across a broad range of hardware or software and it looks exactly as you planned - layouts, fonts and images intact.

product id: 58060

\$499.95

Adobe Elements



Adobe Photoshop Elements 2.0

Powerful image editing software for print, e-mail, and web. Elements 2.0 offers power & simplicity so you can do more with photos. Quick corrections & creative editing gives high-quality results. For digital or scanned traditional photos, Photoshop Elements makes imaging a breeze.

product id: 415733

\$165

Age of Mythology



Age of Mythology

Transports players to a time when heroes battled with monsters of legend and Gods intervened in the affairs of mortal men. The excitement begins when players use the gods to act on their behalf, or reinforce their armies with more than 25 mythological creatures.

product id: Z09-00004

\$94.95

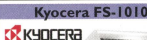


IBM R31

Ready-to-run essentials for mobile users packed into sleek, lightweight system. Features: Intel Celeron processor 1.2GHz/256Mb/20GB/14.1 XGA TFT/CD/Modem/Ethernet/XP Pro.

product id: 417686

\$2449

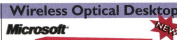


FS-1010

600 x 600 dpi resolution (up to 2400 x 600dpi with KIR2). Up to 14 pages per min. USB Interface. Std/parallel ports/PostScript L2 (KPD/L2) emulation. PowerPC 405 200 Mhz CPU. 16Mb memory (upgradable to 144Mb). ultra low printing costs + 3yr return to base warranty. Lowest Total Cost of Ownership.

product id: 107791

\$635



Microsoft Wireless Optical Desktop

Built for Maximum Performance, designed for Maximum Style. Get everything you've always wanted with a wireless optical keyboard and mouse in one package! Microsoft Wireless Optical Desktop gives you freedom, stylish looks, and one-touch features. It's the all-in-one desktop solution!

product id: 416782

\$195

DWL-900 AP+



AirPlus 22Mbps Wireless LAN Access Point

IEEE 802.11b 2.4Ghz Compliant to 11Mbps Wireless products. 64/128/256 Wired Equivalent Privacy. Config & Mgt via Browser. Dynamic Host Configuration Protocol (DHCP). Detachable Antenna. Reversed SMA Connector.

product id: 141378

\$269

DWL-650+



AirPlus 22Mbps Wireless LAN PCMCIA Adapter

IEEE 802.11b 2.4Ghz Compliant with other 11Mbps Wireless products. 64/128/256 Wired Equivalent Privacy (WEP). Peer-to-Peer (No Access Point) & Infrastructure (Access Point) Mode.

product id: 54543

\$123

CD-R 48X Media



CD-R 48X Media 10 Pack

Whether it's music mastering, multimedia production or digital imaging, Imation CD-R discs store data swiftly and permanently with write speeds up to 48X, and cannot be erased or overwritten. Applications: digital audio mastering, archiving and demos, multimedia production and recording, document imaging, and computer data backup and archiving.

product id: 64-0000-4680-6

\$9.95

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CANON BJC-5015/7010/8010/8015/8016/8017	9	3-BKL
CANON BJC-5015/7010/8010/8015/8016/8017	16	5-BKL
EPSON Stylus Color 2000/4000/1004/2004/3004/4000/5000/5500/5600 BCI-21	9	18-BKL
CANON BJC-3000/8000/9000/9500/9600/9700/9800/9900/1000/1010/1020/1030/1040/1050/1060/1070/1080/1090/1100/1110/1120/1130/1140/1150/1160/1170/1180/1190/1200/1210/1220/1230/1240/1250/1260/1270/1280/1290/1300/1310/1320/1330/1340/1350/1360/1370/1380/1390/1400/1410/1420/1430/1440/1450/1460/1470/1480/1490/1500/1510/1520/1530/1540/1550/1560/1570/1580/1590/1600/1610/1620/1630/1640/1650/1660/1670/1680/1690/1700/1710/1720/1730/1740/1750/1760/1770/1780/1790/1800/1810/1820/1830/1840/1850/1860/1870/1880/1890/1900/1910/1920/1930/1940/1950/1960/1970/1980/1990/2000/2010/2020/2030/2040/2050/2060/2070/2080/2090/2100/2110/2120/2130/2140/2150/2160/2170/2180/2190/2200/2210/2220/2230/2240/2250/2260/2270/2280/2290/2300/2310/2320/2330/2340/2350/2360/2370/2380/2390/2400/2410/2420/2430/2440/2450/2460/2470/2480/2490/2500/2510/2520/2530/2540/2550/2560/2570/2580/2590/2600/2610/2620/2630/2640/2650/2660/2670/2680/2690/2700/2710/2720/2730/2740/2750/2760/2770/2780/2790/2800/2810/2820/2830/2840/2850/2860/2870/2880/2890/2900/2910/2920/2930/2940/2950/2960/2970/2980/2990/3000/3010/3020/3030/3040/3050/3060/3070/3080/3090/3100/3110/3120/3130/3140/3150/3160/3170/3180/3190/3200/3210/3220/3230/3240/3250/3260/3270/3280/3290/3300/3310/3320/3330/3340/3350/3360/3370/3380/3390/3400/3410/3420/3430/3440/3450/3460/3470/3480/3490/3500/3510/3520/3530/3540/3550/3560/3570/3580/3590/3600/3610/3620/3630/3640/3650/3660/3670/3680/3690/3700/3710/3720/3730/3740/3750/3760/3770/3780/3790/3800/3810/3820/3830/3840/3850/3860/3870/3880/3890/3900/3910/3920/3930/3940/3950/3960/3970/3980/3990/4000/4010/4020/4030/4040/4050/4060/4070/4080/4090/4100/4110/4120/4130/4140/4150/4160/4170/4180/4190/4200/4210/4220/4230/4240/4250/4260/4270/4280/4290/4300/4310/4320/4330/4340/4350/4360/4370/4380/4390/4400/4410/4420/4430/4440/4450/4460/4470/4480/4490/4500/4510/4520/4530/4540/4550/4560/4570/4580/4590/4600/4610/4620/4630/4640/4650/4660/4670/4680/4690/4700/4710/4720/4730/4740/4750/4760/4770/4780/4790/4800/4810/4820/4830/4840/4850/4860/4870/4880/4890/4900/4910/4920/4930/4940/4950/4960/4970/4980/4990/5000/5010/5020/5030/5040/5050/5060/5070/5080/5090/5100/5110/5120/5130/5140/5150/5160/5170/5180/5190/5200/5210/5220/5230/5240/5250/5260/5270/5280/5290/5300/5310/5320/5330/5340/5350/5360/5370/5380/5390/5400/5410/5420/5430/5440/5450/5460/5470/5480/5490/5500/5510/5520/5530/5540/5550/5560/5570/5580/5590/5600/5610/5620/5630/5640/5650/5660/5670/5680/5690/5700/5710/5720/5730/5740/5750/5760/5770/5780/5790/5800/5810/5820/5830/5840/5850/5860/5870/5880/5890/5900/5910/5920/5930/5940/5950/5960/5970/5980/5990/6000/6010/6020/6030/6040/6050/6060/6070/6080/6090/6100/6110/6120/6130/6140/6150/6160/6170/6180/6190/6200/6210/6220/6230/6240/6250/6260/6270/6280/6290/6300/6310/6320/6330/6340/6350/6360/6370/6380/6390/6400/6410/6420/6430/6440/6450/6460/6470/6480/6490/6500/6510/6520/6530/6540/6550/6560/6570/6580/6590/6600/6610/6620/6630/6640/6650/6660/6670/6680/6690/6700/6710/6720/6730/6740/6750/6760/6770/6780/6790/6800/6810/6820/6830/6840/6850/6860/6870/6880/6890/6900/6910/6920/6930/6940/6950/6960/6970/6980/6990/7000/7010/7020/7030/7040/7050/7060/7070/7080/7090/7100/7110/7120/7130/7140/7150/7160/7170/7180/7190/7200/7210/7220/7230/7240/7250/7260/7270/7280/7290/7300/7310/7320/7330/7340/7350/7360/7370/7380/7390/7400/7410/7420/7430/7440/7450/7460/7470/7480/7490/7500/7510/7520/7530/7540/7550/7560/7570/7580/7590/7600/7610/7620/7630/7640/7650/7660/7670/7680/7690/7700/7710/7720/7730/7740/7750/7760/7770/7780/7790/7800/7810/7820/7830/7840/7850/7860/7870/7880/7890/7900/7910/7920/7930/7940/7950/7960/7970/7980/7990/8000/8010/8020/8030/8040/8050/8060/8070/8080/8090/8100/8110/8120/8130/8140/8150/8160/8170/8180/8190/8200/8210/8220/8230/8240/8250/8260/8270/8280/8290/8300/8310/8320/8330/8340/8350/8360/8370/8380/8390/8400/8410/8420/8430/8440/8450/8460/8470/8480/8490/8500/8510/8520/8530/8540/8550/8560/8570/8580/8590/8600/8610/8620/8630/8640/8650/8660/8670/8680/8690/8700/8710/8720/8730/8740/8750/8760/8770/8780/8790/8800/8810/8820/8830/8840/8850/8860/8870/8880/8890/8900/8910/8920/8930/8940/8950/8960/8970/8980/8990/9000/9010/9020/9030/9040/9050/9060/9070/9080/9090/9100/9110/9120/9130/9140/9150/9160/9170/9180/9190/9200/9210/9220/9230/9240/9250/9260/9270/9280/9290/9300/9310/9320/9330/9340/9350/9360/9370/9380/9390/9400/9410/9420/9430/9440/9450/9460/9470/9480/9490/9500/9510/9520/9530/9540/9550/9560/9570/9580/9590/9600/9610/9620/9630/9640/9650/9660/9670/9680/9690/9700/9710/9720/9730/9740/9750/9760/9770/9780/9790/9800/9810/9820/9830/9840/9850/9860/9870/9880/9890/9900/9910/9920/9930/9940/9950/9960/9970/9980/9990/10000		

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DESCRIPTION (Inks Compatible with Printers listed below)

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CANON BJC-5015/7010/8010/8015/8016/8017	3x8	25-CLR
CANON BJC-5015/7010/8010/8015/8016/8017	3x8	10-CLR
CANON BJC-5015/7010/8010/8015/8016/8017	3x8	17-CLR
EPSON Stylus Color 2000/4000/1004/2004/3004/4000/5000/5500/5600 BCI-21	3x30	41-CLR
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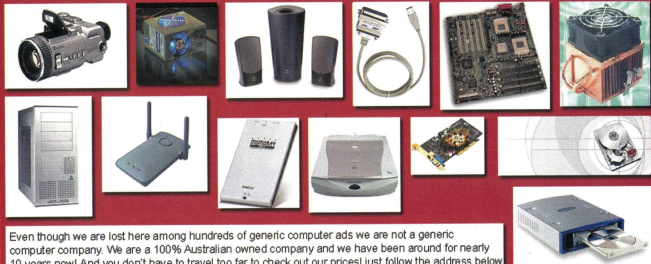
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*Intel, the intel inside logo and Pentium are registered trademarks of Intel Corporation



SuperPro 600SC Server

Entry Level Server
Great performance
Great price

\$899.00 or \$8.34 p/w*

- ◆ Intel® Pentium® 4 processor 1.7GHz
- ◆ GIGABYTE GA-8IRML Motherboard,
 - Intel® 845 Chipset
 - 2DDR333/1AGP/2USB
 - Integrated Intel® NIC
- ◆ 128MB DDR RAM PC-2100
- ◆ 40Gb Ultra ATA-100
- ◆ 32MB TNT2 video
- ◆ 300W ATX Case
- ◆ Floppy Disk and CD-ROM Drives
- ◆ Keyboard & Mouse

SuperPro Server 8600

High-Performance Server for
Department and Internet
Solutions,
Maximum potential,
Great price



- ◆ Dual Intel® Xeon™ processor 2.4GHz
- ◆ Intel® SHG2 Server Board
 - Supports up to 12 GB ECC Registered DDR200/266
 - 2x Integrated Intel® PRO/100+ Server NIC
 - dual-channel SCSI Ultra 160
 - Intel® Server Control Management Software
- ◆ Intel® SRCMRU RAID controller with 32MB
- ◆ 1GB Registered DDR RAM With ECC
- ◆ 2x Seagate 36GB 15k rpm LVD SCSI HDD (Hot-Swap)
- ◆ Intel® Server Chassis SC5200 5U Pedestal
 - Dual 550W Power Supply +1 350W for redundancy
 - 5-bays SCA type hotswap backplane
- ◆ Floppy Disk and CD-ROM Drives
- ◆ Keyboard & Mouse

\$7992 or \$70.08 p/w*

SuperPro Server 7600

Superior Performance for Reliable
and Manageable High-Density
Solutions.



- ◆ Dual Intel® Xeon™ processor 2.0GHz
- ◆ Intel® SWV2-SCSI Server Board
 - Supports up to 12 GB ECC Registered DDR200/266
 - 2x Integrated Intel® PRO/100+ Server NIC
 - dual-channel SCSI Ultra 160
 - Intel® Server Control Management Software
- ◆ 512MB Registered DDR RAM With ECC
- ◆ 2x Seagate 18GB 10k rpm LVD SCSI HDD (Hot-Swap)
- ◆ Intel® Server Chassis SR2300-2U
- ◆ Floppy Disk and CD-ROM Drives
- ◆ Keyboard & Mouse

\$5479 or \$50.68 p/w*

SuperPro Server 5600

Versatility and Processing Power for
Small and Medium-Sized Businesses

- ◆ Intel® Xeon™ processor 2.0GHz
- ◆ Intel® SA12-SE7500CW2 Server Board
 - Dual processor capable
 - Supports up to 4 GB ECC DDR200/266
 - 2x Integrated Intel® PRO/100+ Server NIC
 - Integrated ATA/100 dual-channel Promise Raid
- ◆ Intel® Server Control Management Software
- ◆ 512MB Registered DDR RAM With ECC
- ◆ 2x Maxtor 120GB 7,200 rpm Hard Drive
- ◆ Intel® Server Chassis SC5200 5U Pedestal
- ◆ Floppy Disk and CD-ROM Drives
- ◆ Keyboard & Mouse

\$3399 or \$33.34 p/w*

SuperPro Server 3600

Essential Features for Entry-Level Server
Application, Maximum potential,
minimum price

- ◆ Intel® Pentium® 4 processor 2.4GHz
- ◆ Intel® SB45WD1-E Server Board
 - Supports up to 2 GB ECC DDR200/266 unregistered
 - 2x Integrated Intel® PRO/100+ Server NIC
 - Integrated ATA/100 dual-channel Promise Raid
- ◆ 256MB DDR RAM With ECC unregistered
- ◆ Seagate 80GB 7,200 rpm Hard Drive
- ◆ Intel® Server Chassis SC5100 5U Pedestal
- ◆ Floppy Disk and CD-ROM Drives
- ◆ Keyboard & Mouse

\$2239 or \$22.71 p/w*

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Fax: (02) 9519 2700

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Email: sales@cwsydney.com.au



COMPUTER WAREHOUSE SYDNEY

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The Best System Builder For Your Unique Needs

DECEMBER 2002

Reliability, Flexibility, Performance combined with the friendly prices is the center part of the CW Sydney desktop series. Thanks to the Intel® Pentium® 4 Processor, you get tomorrow's technology for today's application. Now you can enjoy gaming, music, graphic design, business application and online fun with this special designed desktop series.

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StationPro 2025

Minimum Price, Extend Performance

\$969

Intel® Pentium® 1.8GHz \$1149

Intel® Pentium® 2.0Hz \$1189

Intel® Pentium® 2.4GHz \$1269

- ◆ Intel® Celeron® Processor 1.7GHz
- ◆ ASUS P4SDR-VM M/B - **SIS 650/2SD/3PCI/2USB**
- ◆ 128MB PC133 SD RAM
- ◆ 40GB Hard Disk
- ◆ 64MB Share On-Board Video
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Internet keyboard
- ◆ PS2 Mouse
- ◆ MS Windows XP home

QuamPro 5025

Maximum potential, minimum price

- ◆ Intel® Pentium® 4 Processor 1.7GHz
- ◆ Gigabyte 8IE M/B
- ◆ - Intel® 845E/3DDR/533FSB/5PC/USB2.0
- ◆ 256 MB PC2100 DDR RAM
- ◆ 60GB 7200rpm Hard Disk
- ◆ GeForce 4, 440 64MB AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Integrated Realtek ALC650 6-channel audio
- ◆ Altec Lansing AVS33 Subwoofer Speakers
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ MS Windows XP home
- ◆ Microsoft Internet keyboard
- ◆ Microsoft Optical Mouse
- ◆ MS Windows XP home

QuamPro SC505

Great performance, great price

- ◆ Intel® Pentium® 4 Processor 2.0GHz
- ◆ Intel® 845GB M/B
- ◆ - Intel® D645G/533FSB/6PC/DDR/USB2.0
- ◆ 256 MB PC2100 DDR RAM
- ◆ 80GB 7200rpm Hard Disk
- ◆ GeForce 4, 480 128MB AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Altec Lansing AVS33 Subwoofer Speakers
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ MS Windows XP home
- ◆ Microsoft Internet keyboard
- ◆ Microsoft Optical Mouse
- ◆ MS Windows XP home

LuxuryPro 6025

Maximum performance without the high price

- ◆ Intel® Pentium® 4 Processor 2.4GHz
- ◆ ASUS P4SBX M/B
- ◆ - SIS 846/533FSB/AGPb/Firewire/RAID133/USB2
- ◆ **512 MB PC2700 DDR RAM**
- ◆ 2x80GB Western Digital 8M Buffer 7200rpm HDD
- ◆ Leadtek GeForce 4, T1400 128MB VIVO AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Creative SoundBlaster Audigy Audio
- ◆ Creative Inspire 5100, 5.1 Subwoofer Speaker
- ◆ Microsoft Cordless Internet keyboard
- ◆ Microsoft Cordless Mouse
- ◆ MS Windows XP home

\$1549

Intel® Pentium® 1.8GHz \$1589
Intel® Pentium® 2.0GHz \$1629
Intel® Pentium® 2.4GHz \$1709

\$1809

Intel® Pentium® 2.4GHz \$1889
Intel® Pentium® 2.53Hz \$1999
Intel® Pentium® 2.66Hz \$2369

\$3099

Intel® Pentium® 2.53GHz \$3209
Intel® Pentium® 2.66Hz \$3589
Intel® Pentium® 2.86Hz \$3819

Titanium 7025

Seriously powerful multimedia machine

\$2169

Intel® Pentium® 2.53GHz \$2289
Intel® Pentium® 2.67GHz \$2659
Intel® Pentium® 2.80GHz \$2889

- ◆ Intel® Pentium® 4 Processor 2.4GHz
- ◆ Gigabyte GA-8PE67 M/B Pro
- ◆ - Intel® 845PE/533FSB/3DDR333E/USB2.0
- ◆ **512 MB PC2700 DDR RAM**
- ◆ 80GB 7200rpm Hard Disk
- ◆ Leadtek GeForce 4, T14200 128MB VIVO AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Integrated Realtek ALC650 6-channel audio
- ◆ Altec Lansing AVS33 Subwoofer Speakers
- ◆ Microsoft Cordless Internet keyboard
- ◆ Microsoft Cordless Mouse
- ◆ MS Windows XP home

* All Systems come with (unless specify): Aspen KF-45 ATX Case, Integrated 3D Soundboard, 56k V.92 PCI Fax/Modem, 1.44 Floppy Disk Drive, 180W Amplifier Speakers.

THIS MONTH SPECIAL

ADD A MONITOR TO SYDNEY

VIEWSONIC: 17" \$255, PHILIPS: 15" LCD 15093F \$717, 17" LCD 17082B \$1175, LG: 15" \$210, 17" \$270, 17" Flat \$380, VIEWSONIC: 15" \$165, Philips: 17" 107E \$290, 17" 107T Flat \$370, 19" Flat \$740 Hitachi: 17" CM615 \$290, CM621 (F) \$360, 19" CM721 (F) \$899, 21" CM823 \$1550, 15" LCD \$710, 17" LCD \$1399, LG: 15" LCD \$750, SONY: 15" LCD \$899, 18" LCD \$2622.

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The Best System Builder For Your Unique Needs

Performance, Expendability and Better value for money are the center part of the CW Sydney HomePro and GamePro series. Thanks to the AMD Athlon® XP Processor which bring you the powerful machine and you can be sure of seriously great entertainment at a seriously good price.



HomePro SC160

Minimum Price, Extend Performance

\$999

AMD Athlon™ XP 1700 + \$1059
AMD Athlon™ XP 2000 + \$1109

- ◆ AMD Duron™ 1200 Processor
- ◆ ASUS A7N266-VM M/B
- 2DDR33PC/AGP4x/USB
- ◆ 128 MB PC2100 DDR RAM
- ◆ 40GB Hard Disk
- ◆ Integrated NVIDIA GeForce 2 Video
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Internet keyboard
- ◆ PS2 Mouse
- ◆ MS Windows XP home

HomePro 3025

Great Performance, Great price

- ◆ AMD Duron™ 1300 Processor
- ◆ Gigabyte 7DXE M/B
- AMD 6713DDR5/PC/USB
- ◆ 256 MB PC2100 DDR RAM
- ◆ 40GB Hard Disk
- ◆ GeForce 2 MX400 64MB AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ Microsoft Internet keyboard
- ◆ Microsoft Optical Mouse
- ◆ MS Windows XP home

\$1109

AMD Athlon™ XP 1700 + \$1209
AMD Athlon™ XP 2000 + \$1259
AMD Athlon™ XP 2100 + \$1319

MultimediaPro 8025

Serious Multimedia Performer

- ◆ AMD Athlon™ 2000+ Processor
- ◆ Gigabyte 7VA M/B
- ◆ KT400/AGP8x/3DDR400/5PC/4USB2.0
- ◆ 256 MB PC3200 DDR RAM
- ◆ 80GB 7200rpm Hard Disk
- ◆ ASUS 48x40x12 CD-RW
- ◆ GeForce 4 MX460 128MB AGP
- ◆ Pioneer 16x DVD Rom Drive
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ Integrated Realtek AL650 6-channel audio
- ◆ 1500W Subwoofer Speakers
- ◆ Microsoft Internet keyboard
- ◆ Microsoft Optical Mouse
- ◆ MS Windows XP home

\$1669

AMD Athlon™ XP 2100 + \$1729
AMD Athlon™ XP 2200 + \$1799
AMD Athlon™ XP 2400 + \$1869

GamePro SC905

Seriously Powerful Gaming

- ◆ AMD Athlon™ XP 2000+ Processor
- ◆ ASUS A7V8X M/B
- KT400/AGP8x/Firewire/3DDR/5PC/USB2
- ◆ 512 MB PC3200 DDR RAM
- ◆ 80GB Western Digital 7200rpm 8MB Buffer Hard Disk
- ◆ Leadtek GeForce 4 Ti4200 128MB VIVO AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Creative SoundBlaster Audigy Audio
- ◆ Creative Inspire 5100, 5.1 Subwoofer Speaker
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ Microsoft Internet keyboard
- ◆ Microsoft Optical Mouse
- ◆ MS Windows XP home

\$2369

AMD Athlon™ XP 2100 + \$2429
AMD Athlon™ XP 2200 + \$2509
AMD Athlon™ XP 2400 + \$2579

GamePro 9025

Your Dream Powerful Machine

\$3359

AMD Athlon™ XP 2100 + \$3419
AMD Athlon™ XP 2200 + \$3489
AMD Athlon™ XP 2400 + \$3559

- ◆ AMD Athlon™ XP 2000+ Processor
- ◆ ASUS A7V8X M/B with Raid
- KT400/AGP8x/Firewire/3DDR/5PC/USB2
- ◆ 512 MB PC3200 DDR RAM
- ◆ 2x120GB Serial ATA Hard Disk
- Configurable as RAID 0 or 1
- ◆ Leadtek GeForce 4 Ti4600 128MB VIVO AGP
- ◆ ASUS 48x40x12 CD-RW
- ◆ Pioneer 16x DVD Rom Drive
- ◆ Creative SoundBlaster Audigy Audio
- ◆ Creative Inspire 5100, 5.1 Subwoofer Speaker
- ◆ 10/100 LAN-Broadband Internet ready
- ◆ Microsoft Cordless Internet keyboard
- ◆ Microsoft Cordless Mouse
- ◆ MS Windows XP home

* All Systems come with (unless specify): Silver ATX Case, Integrated 3D Soundboard, 56K V.92 PCI Fax/Modem, 1.44 Floppy Disk Drive, 180W Amplifier Speakers.

THIS MONTH SPECIAL

ADD A MONITOR TO SYSTEM

VIEWSONIC: 17" \$255, PHILIPS: 15" LCD 15053F \$717, 17" LCD 17092B \$1175, LG: 15" \$210, 17" \$270, 17" Flat \$380, VIEWSONIC: 15" \$165, Philips: 17" 107E \$290 17" 107T Flat \$370, 18" Flat \$740 Hitachi: 17" CM615 \$290, CM621 (F) \$350, 19" CM721(F) \$599, 21" CM623 \$1550, 15" LCD \$710, 17" LCD \$1399, LG: 16" LCD \$750, SONY: 16" LCD \$899, 18" LCD \$2622.

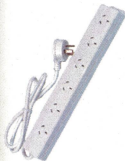
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Complete Power Protections

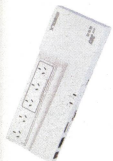
6-way surge
board+
tel protection



\$43

Sola 305

**Affordable Power
Protection for
PC's and SOHO
applications**



Sola 305 250VA

\$149

Sola 305 500VA

\$199

All Solo UPSs come with two years power warranty

All SOLA UPSs are specifically designed for Australian applications with multiple Australian sockets, eliminating the need for messy adaptors. The product is tested and approved to Australian EMC and Safety Standards and carries both the C-Tick and A-Tick marks indicating compliance to the relevant Standards.

Sola 325

400 - 1000VA
*Intranet ready advanced power protection
for PCs, workstations and smaller servers*

All controls and indicators are located on the front panel including the SOLA PowerSteady™ Buck/Boost Indicator which advises when high and low line conditions occur. Batteries are hot swappable and user replaceable for cost effective maintenance in the future.

Sola 325	
400VA \$310	
750VA \$520	\$5.4 p/w
1000VA \$688	\$7.13 p/w



Sola 520

750VA to 2.25KVA UPS
*Pure, sinewave power protection for
networking computer.*

SOLA 520 is one of the most reliable UPSs in its class. Built-in self-diagnostic routines enable you to spot, diagnose and respond to power problems as they occur, helping safeguard your equipment against premature breakdown, and your data against power-related corruption or loss.

Sola 520		
750VA \$656	\$6.8 p/w	
1050VA \$974	\$10.1 p/w	
1425VA \$1,341	\$13.92 p/w	
1800VA \$1,830	\$18.58 p/w	
2250VA \$2,198	\$22.31 p/w	



UPS Series

Sola 620 Rackmount 1KVA - 3KVA

It is ideally suited to protect your LAN/WAN equipment. It's inbuilt BestDock™ communication slot for the optional Bestlink™ SNMP/Web adaptor, allows easy interface and monitoring. It also features inbuilt TVSS to protect the network, as well as new temperature compensated battery charger to extend battery life.

Sola 620		
700VA \$1,044	\$10.83 p/w	
1000VA \$1,496	\$15.54 p/w	
1500VA \$2,027	\$20.58 p/w	
2000VA \$2,767	\$27.13 p/w	
3000VA \$4,002	\$37.86 p/w	



Sola 625 Rackmount 700VA - 6000KVA

Sola 625 Rackmount 700VA - 6000KVA Online double conversion UPS for mission critical applications. Provides constant voltage (240V) regardless

of input voltage. User Friendly, Informative LCD Display The revolutionary 625 includes a user friendly LCD that is normally only found on considerably larger UPS systems. The LCD display panel makes it extremely easy to configure your UPS to fit your application. In addition, the 625 has the capacity to monitor your equipment using different tests

Sola 625 700VA \$1,044	(\$10.83 p/w), 1000VA \$1,496
(\$15.54 p/w), 1500VA \$2,027	(\$20.58 p/w), 2000VA
\$2,767	(\$27.13 p/w), 3000VA \$4,002
(\$37.86 p/w), 6000VA \$6,233	(\$54.65 p/w)





The Best System Builder For Your Unique Needs

DECEMBER 2002

MasterView SOHO KVM Switch

- Easy to install - No software required
- Easy to operate



CS-12C R.R.P. **\$150**
(PRICE INCL. CABLE)

2 Port Compact KVM Switch

- Controls and monitor 2 PC system from one single console
- Easy to operate - PC selection via push button switch or Hot keys.
- Keyboard & mouse emulation for error free PC booting
- Supports 1920 x 1440 Resolution



CS-14C R.R.P. **\$230**
(PRICE INCL. CABLE)

4 Port Compact KVM Switch

- Controls and monitor 4 PC system from one single console
- Easy to operate - PC selection via push button switch or Hot keys.
- Keyboard & mouse emulation for error free PC booting
- Supports 1920 x 1440 Resolution



CS-82R R.R.P. **\$99**
(PRICE INCL. CABLE)

2 Port Desktop KVM Switch

- Controls 2 PC systems with one PS/2 Keyboard, PS/2 Mouse and monitor
- Keyboard and Mouse Emulation for Error Free PC Booting
- PC Selection Via Push Button Switches or Hot Key
- Auto Scan Function to Monitor PC Operation



CS-04R R.R.P. **\$189**
(PRICE INCL. CABLE)

4 Port Desktop KVM Switch

- Controls 4 PS systems with one PS/2 keyboard, PS/2 mouse and monitor
- Keyboard and Mouse Emulation for Error Free PC Booting
- Auto Scan Function to Monitor PC Operation
- Superior Video Quality

MasterView Professional KVM Switch



CS-114 R.R.P. **\$269**
(PRICE INCL. CABLE)

4 Port MasterView Plus

- Cascadable to three levels - Controls up to 64 PCs from a single console
- Master and slave units are now auto detected when daisy chaining
- PS/2 and Serial Mouse Emulation provided for system boot-up
- LED Display for easy status monitoring
- Uses standard cables



CS-122 R.R.P. **\$189**
(PRICE INCL. CABLE)

2 Port MasterView Plus

- Control up to 2 PC systems - Cascadable to three levels
- PC Selection via Front Panel Pushbuttons or Hot Keys
- PS/2 and Serial Mouse Emulation provided for system boot-up
- Easy PC Selection via Front Panel Pushbuttons or Hot Keys
- Auto Scan Mode for monitoring PCs



CS-128R R.R.P. **\$625**
(PRICE INCL. CABLE)

8 Port MasterView Pro

- Controls 8 PC systems; Cascadable to 302 PC systems
- Mouse Conversion: PS/2 Mice control all connected PCs
- Superior Video Quality (1920x1440)
- LED Display for easy status monitoring
- Optional Custom cable for superior signal quality



UN-101 R.R.P. **\$49**

PC to PC USB Network Cable

- Ideal file transfer solution for home networking
- Quick and easy solution for host-to-host communications at speed equivalent to an Ethernet 10Base-T connection
- Supports file transfer for Windows peer-to-peer connections

Video Splitter / Converter



VS-92R R.R.P. **\$88**

2 Port Video Splitter - 250MHz

- 1 video input to 2 video outputs
- Transmission distance up to 65m
- Suitable for SVGA, VGA, and Multisync monitors
- Daisy-Chainable for more outputs
- Ideal for public broadcasting; remote monitoring; classroom and training facilities



VS-94R R.R.P. **\$120**

4 Port Video Splitter - 250MHz

- 1 video input to 4 video outputs
- Transmission distance up to 65m
- Suitable for SVGA, VGA, and Multisync monitors
- Daisy-Chainable for more outputs
- Ideal for public broadcasting; remote monitoring; classroom and training facilities



VS-98R R.R.P. **\$180**

8 Port Video Splitter - 150MHz

- 1 video input to 8 video outputs
- Transmission distance up to 65m
- Suitable for SVGA, VGA, and Multisync monitors
- Daisy-Chainable for more outputs
- Ideal for public broadcasting; remote monitoring; classroom and training facilities



VC-1024 R.R.P. **\$330**

VGA to TV Converter

- True Plug & Play, no software required
- Compatible with any PC or Mac with VGA video output
- The scan rates up to 100Hz are supported for 640x480 resolution
- True color quality
- Supports NTSC, PAL and SECAM
- OSD (On Screen Display) function



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GME-421
Web Cruiser (4 Direction Scrolling Optical Mouse)

- 4 directional scroll ball allows you to scroll up, down, left and right
- Superior optical sensor tracks movement 1500 times per second to provide smooth-precision tracking on any surface
- On screen digital zoomer magnifies any area on screen



GME-221
Mini Mouse (Mini USB Optical Mouse w/ scroll wheel)

- Superior optical sensor tracks movement 1500 times per second to provide smooth-precision tracking on any surface
- Light and portable, great for mobile professionals
- Compact design to save precious space in your mobile work area
- Includes a leather carrying case in package



GFR-201
Memory Bank (Hi-Speed USB2.0 Flash Card Reader)

- Hi-Speed USB2.0 Certified - download 128MB in 30seconds!!
- Supports MicroDrive up to 1GB, CompactFlash Type II Spec v1.2
- Remarkable high-speed digital image and data transfer to computer



GUF-202
USB2.0/Firewire Combo CardBus

- Upgrade your notebook PC or Mac to USB2.0 and Firewire
- 2 x USB2.0 Type A ports
- 1 x Firewire 4pin port & 1 x Firewire 6pin port
- USB2.0 and IEEE1394, 1394OHCI v1.0 1394A v2.0 compliant



GUH-204
4 Port USB2.0 Mini Hub

- 4 USB2.0 external ports
- Over-current surge protection
- LEDs allows for easy status monitoring



GBU-301
Bluetooth to USB Adapter

- Allows any computer with USB connectors to become a Bluetooth enabled computer

SPECIAL



GCS-62
2 Port MiniView Micro KVM Switch

- The smallest 2 port KVM Switch available
- Molded-in cables to simplify setup
- Port selection through convenient Hot Keys
- PS/2 mouse emulation for error-free boot-up



GUN-202
SmartLink 2 Networking Cable

- USB2.0 based Peer-to-Peer Networking of up to 20 computers, perfect for small office or home office network
- Share files and resources such as printers, scanners, etc
- Internet sharing via dialup MODEM connection
- Supports TCP/IP, IPX/SPX protocols



Let Technology Light Up your Life!!



USB Flash Drive
With password function

- Easy to carry, Easy to use
- Support USB Specification Revision 1.1
- Supports Plug & Play Function
- Automatically detected by Windows 2000/ME/Mac 8.6 or above
- Write/Delete Protection Switch - to prevent accidental mistakes
- LED Indicator when USB driver in use

STANDARD		WITH PASSWORD	
32MB	\$75	32MB	\$85
64MB	\$100	64MB	\$125
128MB	\$179	128MB	\$200
256MB	\$339	256MB	\$429
512MB	\$709	512MB	\$759
1024MB	CALL	1024MB	CALL



USB/CF Mini Drive

- 2 in 1 Design - USB Flash Drive with built-in Flash Memory and CF Card Extension Reader Slot
- Support USB Specification Revision 1.1
- Supports Plug & Play Function
- Automatically detected by Windows 2000/ME/Mac 8.6 or above
- Support all Type I and II Compact Flash Card and IBM Microdrive

TWIN DRIVE

32MB	\$99
64MB	\$135
128MB	\$210
256MB	CALL

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Web: www.cwsydney.com.au
Email: sales@cwsydney.com.au



Networking & Communication

MODEM

Mega-i-Modem CD2003

A 56K Data/Fax modem, it still delivers Internet access at the lowest cost.


\$89

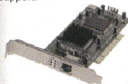
USB LAN Key 10/100Mbps NP1010

Plugs into USB port to provide instant Ethernet connectivity.


\$55

Gigabit Copper Network Card (32-bit) NP1800

This 32-bit PCI Gigabit over Copper adaptor includes the newest networking technologies, such as VLAN, VLAN tag insertion support, and Auto MDI-II/MDI-X crossover capabilities, multicasting and has a wide range of operating system support.


\$139

Switch



- **5-Port 10/100Mbps SmartSwitch NP2005** 5-Port mini N-Way high speed switch. Auto detect full or half duplex **\$115**
- **8-Port 10/100Mbps SmartSwitch NP2008** 5-Port mini N-Way high speed switch. Auto detect full or half duplex **\$173**
- **8-Port 10/100Mbps ProSwitch NP2080** 8 Port N-Way high speed FAST Ethernet switch, auto detect full or half duplex, store and forward architecture, MDI Uplink Port to cascade additional switches. In-built 240VAC power supply. **\$217**
- **16-Port Pro Switch NP2160** 16 high-speed 10/100 ethernet ports with store & forward switching, back pressure flow control and address learning capabilities. **\$537** *5.57 p/w
- **24-Port Pro Switch NP2240** 16 high-speed 10/100 ethernet ports with store & forward switching, back pressure flow control and address learning capabilities. **\$717** *7.45 p/w
- **Gigabit Pro Switch NP2480** 26 port ProSwitch provides 24 x 10/100Mbps Fast Ethernet and 2 x 1000Mbps Gigabit **\$1,654** *16.79 p/w

ADSL



- **Cable/DSL Wireless Router/4-port switch NB3000** Wireless router for ADSL and Cable modems. Transmits speed at 11Mb and Wireless range up to 91 m res indoors. In-built 4 port 10/100 switch. Includes 128-bit WEP encryption to ensure privacy. **\$439**
- **Cable/DSL Firewall Router/4-port switch NB3100** Advanced Firewall Router for ADSL and Cable modems. Supports Denial of Service and URL Filtering. Supports VPN*, IPsec and PPTP pass through. Can block all Java and Active X code as well as cookies. Built-in 4-port 10/100 switch. **\$331**
- **Cable/DSL VPN Router/4-port switch NB3200** VPN Router for ADSL and Cable modems. The NB3200 provides full IPsec VPN tunnelling* and firewall protection for your cable or ADSL modem. True End Point to End Point IPsec VPN solution with 3DES encryption. Built-in 4-port 10/100 switch. **\$412**
- **ADSL Modem/Router/4-port switch NB3300** ADSL modem and router in one. Ethernet interface with 4 port 10/100 switch. Supports PPPoA, PPPoE and Bridged protocols. NAT, IP Port filtering, IPsec passthrough, Remote Access, DMZ hosting, DHCP. **\$398**



Wireless

- **Wireless LAN Access Point NP7000** NetComm's Wireless LAN with bridging Access Point is high speed 11Mbps-IEEE802.11b access to network resources **\$398**
- **PCMCIA Wireless Card NP7030** Wireless LAN PCMCIA card Supporting 11Mbps-IEEE802.11b standards incl 64 & 128bit WEP encryption. **\$163**
- **USB Wireless LAN Adapter NP7040** NetComm's USB Wireless Lan Adapter. Supporting the latest 11Mbps-IEEE802.11b standards incl 64 & 128bit WEP encryption. **\$181**
- **CompactFlash Wireless NP7050** Wireless LAN Compact Flash Card provides LAN access for PDAs (Personal Digital Assistants) from any environment equipped with an 11Mbps-IEEE802.11b standards incl. 64 & 128bit WEP encryption. **\$242**



Networking & Storage Solutions

DECEMBER 2002



Network adapter
32 bit 10/100
High performance



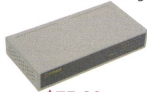
\$16.00

5 port switch
10/100 auto sensing



\$60.00

8 port switch
10/100 auto sensing



\$75.00

CD Library
USB 150 CDs Library
/MANAGEMENT



\$185.00

New generation Gigabit product

PCI Bus Adapter
(32/64-bit)



\$105.00

(Gigabit) connections to Servers
& Workstations

1 PORT GIGA
+ 8 10/100 SWITCH



\$375.00

A workgroup solution helping to
increase network throughput for
increased server to client response

2 PORT GIGA
+ 8 10/100 SWITCH



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19" rack-mountable
Supports Virtual Local Area
Networking

External Hard Drive Easy way to make back-up copies of your files

USB1.1

Pocket Boy For 2.5" HDD
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PC & Mac

\$60



USB2.0

Pocket Boy For 2.5" HDD
Support
PC & Mac

\$85



FIREWIRE

Pocket Boy For 2.5" HDD
Support
PC & Mac

\$90



Crystal case For 3.5"HDD
Support
PC & Mac

\$80



Crystal case For 3.5"HDD
Support
PC & Mac

\$120



Crystal case For 3.5"HDD
Support
PC & Mac

\$130



5.25" Sky case
For CD-ROM/CD-RW

\$120



5.25" Sky case
For CD-ROM/CD-RW

\$135



5.25" Sky case
For CD-ROM/CD-RW

\$135



SMC

Network adapter
WOL, high performance

\$18.00



24 Port Switch
Ultra-fast high-performance
Auto-negotiating

\$525



24 Management Switch
Ultra-fast high-performance
stackable
2EXT slot support 100FX,
1000T/SX/LX

\$1725





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KINGMAX®

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DECEMBER 2002

Memory for Next Generation Today

Kingmax 10/100 Dual Speed Hubs



■ KVM-K1025K KVM 2-port Auto Switch Kit **\$140.00**

With / Two sets of High Grade Cable (L=1.2m)
Use one keyboard, monitor and mouse to control two computers
Support 95,98,98E,2000,2000ME,Win NT, Unix and Linux.

■ KVM-K1045K KVM 4-port Auto Switch **\$170.00**

KVM-K1045K KVM 4-port Auto Switch
Use one keyboard, monitor and mouse to control two computers
Support 95,98,98E,2000,2000ME,Win NT, Unix and Linux.

■ KA/L.2MKVIM **\$44.00**

1 set High Grade Cable (L=1.2m)

Kingmax Networking First 3 month On-site Replacement

■ KH324A Metal Case Rackmountable

24 port auto-negotiation 10/100Mbps
IEEE802.3 10Base-T, 802.3u 100Base-TX
RJ-45 ports and one uplink port provided
Dual speed hubs, Metal Case
Stackable to 6 units, PnP, Internal Power



Services area (NSW, Mel, Qld, S.A., W.A., N.T.)
All hubs and switches

\$330.00



Switching Hubs

■ AKS3205 Metal Case **\$90.00**

5 Port auto-negotiation 10/100Mbps
Dual speed SOHO switch, metal Case
RJ-45 ports and one uplink port provided

■ AKS3208 Metal Case **\$110.00**

8 port auto-negotiation 10/100Mbps,
Dual Speed SOHO switch metal Case
RJ-45 ports and one uplink port provided

■ AKS-3216 Metal Case Rackmount **\$280.00**

16 port auto-negotiation 10/100Mbps,
One uplink port for easy link to another switch
11" Desktop or Rack-Mount installation

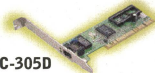
■ KSS4316 Metal Case Rackmount **\$550.00**

16 Auto-negotiation 10/100Mbps
Virtual Lan support network Security
Port Trunking for up to 800Mbps link
Optional 100 Base-FX module

■ KSS4324 Metal Case Rackmount **\$700.00**

24 Auto-negotiation 10/100Mbps
Virtual Lan support network Security
Port Trunking for up to 800Mbps link
Optional 100 Base-FX module

AKC-305D



10/100 PCI Ethernet Card
10/100Mbps Autosensing
Five years warranty

\$19.00

Kingmax TinyBGA Memory



■ DDR Sdram

MPXB62D-68KX TinyBGA	256MB PC3200 400MHz	\$172.00
MPMB62D-68KX TinyBGA	256MB PC2700 333MHz	\$155.00
MPDB62D-68KX TinyBGA	256MB PC2100 266MHz	\$130.00
MPDC22D-38KX TinyBGA	512MB PC2100 266MHz	\$282.00

SuperRAM(TSOP)	512MB PC2700 333MHz	\$280.00
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■ 168Pin ECC PC-133 SDRAM

MPIB63S-68KX TinyBGA	256MB PC133 Mhz ECC Register SDRAM	\$145.00
MPIC63S-68KX TinyBGA	512MB PC133 Mhz ECC Register SDRAM	\$310.00
MPID43S-A43 TinyBGA	1GB PC133 Mhz ECC Register SDRAM	\$590.00

■ DDR ECC Register

MPNC22D-38KX TinyBGA	512MB DDR2100 ECC Register	\$360.00
MPND42D-A4KX TinyBGA	1GB DDR2100 ECC Register	\$760.00

■ 200pin DDR SO-DIMM

MSDA82D-68KX TinyBGA	128MB PC2100 266MHz	\$80.00
MSDB82D-68KX TinyBGA	256MB PC2100 266MHz	\$160.00
MSDC22D-38KX TinyBGA	512MB PC2100 266MHz	\$350.00

■ 144Pin PC133 SO-DIMM

MSGAB2S-68KX TinyBGA	128MB PC133 SDRAM 133MHz	\$75.00
MSGB63S-68KX TinyBGA	256MB PC133 SDRAM 133MHz (1.18")	\$125.00
MSGB63S-68KX TinyBGA	256MB PC133 SDRAM 133MHz	\$120.00
MSGC23S-38KX TinyBGA	512MB PC133 SDRAM 133MHz	\$250.00

KingmaxFlash Memory



■ KCF064MB 64MB Compact Flash card **\$65.00**

■ KCF128MB 128MB Compact Flash card **\$110.00**

■ KCF256MB 256MB Compact Flash card **\$195.00**

■ MMC064M 64MB Multimedia card **\$90.00**

■ MMC128M 128MB Multimedia card **\$200.00**

■ SD64MH 64MB Security Data **\$100.00**

■ SD128MH 128MB Security Data **\$200.00**

■ PD64MB 64MB USB Pen Drive **\$80.00**

■ PD128MB 128MB USB Pen Drive **\$130.00**

■ MS64MB 64MB Memory Stick for sony **\$95.00**

■ MS128MB 128MB Memory Stick for sony **\$165.00**

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DECEMBER 2002

Reliability Storage

ASUS CD-RW-4012A



\$105

- 40x Writing/12x Rewriting/48x Reading Retail box package.
- Swift data recording : burn a full 650 MB CD in 3.5 minutes
- Supports a wide range of application formats: CD-DA, CD-ROM, CD-ROM XA, CD-I, CD-Extra, CD-Text, Video CD, DVCD, and Bootable CD
- Buffer Underrun Errors Prevention
- Technology, Optimal Writing Speed
- Adjustment Technology
- Unique Dust Proof and Noise Control Design

Maxtor Hard Disk



Maxtor 80G/120G/160G/200G

- Fast ATA/Enhanced IDE Compatible
- Ultra ATA/133 Data Transfer Speed
- Serial ATA option with transfer speeds up to 150 MB/sec
- 2 MB Cache Buffer
- Quiet Drive Technology
- 100 % FDB (fluid dynamic bearing) motors
- Maxtor Shock Protection System
- Maxtor Data Protection System

Calypso 80GB UATA133 3.5lp 2MB 8.5MS 7200rpm **\$226**
 Calypso 120GB UATA133 3.5lp 2MB 8.5MS 7200rpm **\$354**
 Calypso 160GB UATA133 3.5lp 2MB 8.5MS 7200rpm **\$566**
 Calypso 200GB UATA133 3.5lp 2MB 8.5MS 7200rpm **\$900**

Sony IDE 2.4X DVD+RW KIT DRU120A



\$686

2.4X DVD Writing & ReWriting, 12X CD Writing, 10X CD ReWriting, 8X DVD-ROM Playback, 32X Max CD Playback, Record CD's and DVD's, Plays CD Audio, CD-ROM and DVD-ROM Disks, Plays Video-CD and DVD Movie Disks Under-Run Protection, Bundled with Software

Seagate Hard Disk



Seagate 40G/60G/80G 7200rpm

- SoftSonic(TM) FDB motor on every drive
- 7,200 RPM desktop performance
- Ultra ATA/100 interface
- 350 Gs nonoperating shock
- 2-Mbyte cache buffer
- 3D Defense System
- DiscWizard software

Seagate Cheetch 18G/36G HDD

Ultra 160 SCSI, up to 160 Mbyte/sec, Cables 15 devices, up to 12 meters. Consisting of Drive Defence, Data Defence and Diagnostic Defence. Just-In-Time minimizes actuator impact on power, vibration and acoustics. 15K rpm spindle speed. The fastest data access in the industry!

Seagate Cheetch 73G SCSI ULTRA 320
 Cheetch 146G SCSI Ultra 320

73GB of capacity, consisting of Drive Defence, Data Defence and Diagnostic Defence. Just-In-Time minimizes actuator impact on power, vibration and acoustics Up to 320-Mbyte/sec transfer rate; Includes Packetization and QAS. Backward compatible with Ultra160. Cables 15 devices, up to 12 meters. 15K RPM spindle speed

Barracuda 40GB ATA IV 7200rpm **\$159**
 Barracuda 60GB ATA IV 7200rpm **\$190**
 Barracuda 80GB ATA IV 7200rpm **\$220**
 Cheetah 18GB SCSI 15000rpm **\$492**
 Cheetah 36GB SCSI 15000rpm **\$803**
 Cheetah 73GB SCSI Ultra320 **\$1,121**
 Cheetah 146GB SCSI Ultra320 **\$2,244**

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 Email: sales@cwsydney.com.au



Video Graphic Solutions



V8420 /DVI

\$381.86

GeForce4 Ti VGA, 128MB DDR Memory, VGA-out, DVI-I

- × NVIDIA® GeForce 4 Ti 4200 GPU, 128MB DDR Video Memory
- × 550MHz (275MHz DDR) 350MHz
- × Fully 1.2 Compliant OpenGL Support
- × 70-240 Hz support 2048 x 1536 x 85Hz

GeForce4 Ti VGA, 128MB DDR Memory, TV-out, DVI

- × NVIDIA® GeForce 4 Ti 4600 GPU
- × 128MB DDR Video Memory
- × Full VIP 1.1 interface
- × Hardware color space conversion and filtering (YUV 4:2:2 and 4:2:0)
- × One S-VHS mini-DIN, and One RCA jack
- × One S-VHS mini-DIN, and one RCA jack to mini-DIN cable



V8460Ultra/TV

\$579.5

V8460Delux/TV

\$702.72 \$7.29 p/w

Hercules Add on Card

3D Prophet 9700 PRO

\$275



- × Incredible 325MHz core / 310MHz RAM clocks
- × 8 pixel-pipelines architecture for increased rendering power
- × 256-bit DDR RAM interface, giving 16.5GB/s RAM bandwidth
- × 128MB DDR memory to fill the latest games with masses of textures
- × A large RAM buffer improves DirectX 8 & 9 Pixel & Vertex Shaders
- × 128MB on-board helps 3D Prophet 9700 PRO to accelerate 3D games on 2 screens
- × This wide buffer gives access to FSAA and anisotropic filtering even in high resolutions
- × HyperZ™III: intelligent memory-bandwidth-saving technology
- × AGP 8X / 4X / 2X support for maximum performance with the latest motherboards

3D Prophet 9000 PRO 128MB

\$363



- × TV/Video Output to display up to 1024x768 on NTSC & PAL TV sets.
- × VIDEO IMMERSION™ technology for high quality playback of DVD movies with minimal CPU resources
- × FULLSTREAM™ technology for accelerated hardware de-blocking of Real/Video™ video streams
- × Hardware HDTV decoder (DCT & Motion Compensation), MPEG-2 decoder, Adaptive Per Pixel De-Interlacing
- × HYDRATION™ flexible management of the display on multiple screens
- × SMARTSHADER™ technology for full DirectX8.1 hardware support in games (Pixel Shaders 1.4 & Vertex Shader 1.1) and OpenGL®1.3.
- × HYPERZ™III bandwidth-saving technology
- × CHARISMA ENGINE™, accelerator engine for Transformation, Clipping & Lighting
- × SMOOTHVISION™ technology to improve image quality, featuring Anti-Aliasing, Anisotropic Filtering
- × TRUFORM™, the revolutionary solution to smooth 3D shapes edges

3D Prophet 9000 128 MB

\$759 \$7.88 p/w



- × 128MB of DDR RAM for impressive performance in all graphics applications, especially for massive texturing
- × SMARTSHADER™ technology for full DirectX8.1 hardware support in games (Pixel Shaders 1.4 & Vertex Shader 1.1) and OpenGL®1.3.
- × HYPERZ™III bandwidth-saving technology
- × CHARISMA ENGINE™, accelerator engine for Transformation, Clipping & Lighting
- × SMOOTHVISION™ technology to improve image quality, featuring Anti-Aliasing, Anisotropic Filtering
- × TRUFORM™, the revolutionary solution to smooth 3D shapes edges

Leadtek Add on Card

WinFast A170 DDR TH MyVIVO

- × NVIDIA GeForce4 MX 440 GPU
- × 64MB DDR Memory
- × 6.4 GB/sec Memory Bandwidth
- × 2 dual-rendering pipelines
- × 4 texels per clock cycle
- × AGP 4X/2X and AGP Texturing Support
- × High-quality HDTV/DVD playback
- × Integrated TV Encoder Supporting 1024x768 resolution
- × Microsoft® DirectX® 8.X and OpenGL® 1.3 Optimizations and Support

\$207.4

WinFast A170 DDR TH MyVIVO with 128MB \$292.8

WinFast A250LETD 128mb TI4200

- × NVIDIA GeForce4 Ti 4200 GPU
- × Lightspeed Memory Architecture™ II
- × nView™ Display Technology
- × Default clock speed 256/500MHz/(core/memory)
- × 4 Billion AA samples per second fill rate
- × 113 Million vertices/sec
- × 1.03 trillion operations/sec
- × 64/128MB high-speed DDR Memory
- × Memory bandwidth up to 8GB/sec
- × Vivid NTSC/PAL TV-out support with flicker filter
- × Microsoft® DirectX® 8 and S3C™ texture compression
- × On-board TV-out support up to 1024x768 resolution
- × On-board DVI support up to 1280x1024 resolution
- × Microsoft® DirectX® 8.X and OpenGL® 1.3 Optimizations and Support

\$347.7

WinFast A250 Ultra TD MyVIVO 128mb TI4600

- × NVIDIA GeForce4 Ti 4600 GPU
- × Default clock speed 300/550MHz/(core/memory)
- × 4.8 Billion AA samples per second fill rate
- × 136 Million vertices/sec
- × 1.23 trillion operations/sec
- × 128MB high-speed DDR Memory
- × Memory bandwidth up to 10.4GB/sec
- × Vivid NTSC/PAL TV-out support with flicker filter
- × High-Definition Video Processor(HDTV)
- × On-board TV-out support up to 800x600 resolution
- × On-board DVI support up to 1280x1024 resolution
- × Microsoft® DirectX® 8.X and OpenGL® 1.3 Optimizations and Support

\$578.28

\$6 p/w

WinFast TP2000 XP Tuner

- × Supports PIP(picture in picture) function.
- × One for live and the other for captured program.
- × Supports MPEG1/MPEG2 video codec and MPEG3 audio codec configuration to get the smaller file size for capturing
- × Supports de-interlaced function to get high quality of motion video
- × Watch high-quality TV with dbx-stereo in full screen or a scalable window
- × Bridging video to PC from VCR, camcorder, LDV/DVD/DVD player
- × Include convenient and cool remote control
- × Support video mail communication

\$126



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Complete Monitor Solutions

DECEMBER 2002

PHILIPS 150S3F 15" LCD MONITOR

- ◆ 15" Visible, Effective viewing area 304.1 x 226.1mm
- ◆ PIXEL PITCH: 0.297 x 0.297mm
- ◆ RESOLUTION: 1024 x 768 pixels, R.G.B vertical stripe
- ◆ BRIGHTNESS: 220 cd/m² (typ.)
- ◆ CONTRAST RATIO: 350 (typ.)

Special!



\$679

\$7.05 p/w

ViewSonic E79 17" CRT MONITOR

- ◆ 16" visible
- ◆ 0.24mm horizontal dot pitch
- ◆ 0.27mm diagonal dot pitch
- ◆ Displays a maximum resolution of 1280 x 1024; 1024 x 768 optimal resolution at 87Hz
- ◆ Win 95/98/NT/2000 compatible

Special!



\$225



SONY

Sony 17" CPD230 TRINITRON CRT MONITOR

- ◆ 16" viewable
- ◆ 0.24 - 0.25mm aperture grille pitch, up to 1800 X 1200 @ 60Hz max res, Windows & Mac compatible,

\$599

\$6.22 p/w

Sony 19" CPD420 TRINITRON CRT MONITOR

- ◆ 18" viewable
- ◆ 0.24 - 0.25mm aperture grille pitch, up to 1920 X 1440 @ 60Hz max res, Windows 95/98/2000/NT/Me & Mac compatible

\$869

\$9.02 p/w



PHILIPS

PHILIPS 170B2B 17" LCD MONITOR

- ◆ 17" Visible, 337.9 X 270.3mm effective viewing area
- ◆ TUBE: 0.264mm pitch,
- ◆ 1280 X 1024 max resolution
- ◆ SCAN RATE: 30-82kHz (vertical) scan range

\$1185

\$15.31 p/w

PHILIPS S1180P2B 18" LCD MONITOR

- ◆ 18" Visible, 359 x 287.2mm effective viewing area
- ◆ CONTRAST RATIO: 350 (typ.), BRIGHTNESS: 250 cd/m² (typ.)
- ◆ RESOLUTION: 1024 x 768 at 75Hz
- ◆ PIXEL PITCH/TYP: 0.280 x 0.280mm
- ◆ VIDEO INTERFACE: Triple input (two connectors): D-Sub (analog) and DVI-I

\$1525

\$18.48 p/w

Sony SDMS51 15" FLAT PANNEL LCD

- ◆ 15" screen size, 1024 x 768 max res,
- ◆ 0.297mm pitch, 300:1 contrast, 200 cd/m² Luminance
- ◆ Light grey front bezel with dark grey rear bezel

\$869

\$9.05 p/w

Sony SDMS71 17" FLAT PANNEL LCD

- ◆ LCD SIZE: Diagonal 17.0", Horizontal 13.3", Vertical 10.6"
- ◆ NATIVE RESOLUTION: 1280 x 1024
- ◆ PIXEL PITCH: 0.279mm
- ◆ COLOURS: 16.78 million
- ◆ CONTRAST RATIO: 400:1 (max)
- ◆ HORIZONTAL SCAN RANGE: 28-82kHz, VERTICAL SCAN RANGE: 48-85Hz
- ◆ VIEWING ANGLE: Horizontal: 140, Vertical: 155

\$1659

\$16.85 p/w

Sony SDMS81 18" FLAT PANNEL LCD

- ◆ SCREEN: 18" LCD Monitor
- ◆ MAX RESOLUTION: 1280 x 1024 @ 85Hz
- ◆ CONTRAST RATIO: 300:1
- ◆ VIEWING ANGLE: 160 degrees (horizontal & vertical)
- ◆ 15 pin mini D-sub input
- ◆ Windows & Macintosh compatible
- ◆ 18 User adjustable settings Vertical: 155

\$2099

\$21.31 p/w

ViewSonic VG500 15" LCD MONITOR

- ◆ Full 15" Visible
- ◆ 1024 x 768 optimum resolution Fh:30-82kHz, Fv:50-75 Hz
- ◆ CONTRAST RATIO: 450:1 (typ.), BRIGHTNESS: 260 cd/m² (typ.)

\$729

\$9.42 p/w

ViewSonic VA700 17" LCD MONITOR

- ◆ Full 17" Visible multimedia
- ◆ 1280x1024 optimum resolution Fh:30-82kHz, Fv:50-75 Hz
- ◆ CONTRAST RATIO: 300:1 (typ.)
- ◆ BRIGHTNESS: 220 cd/m² (typ at center)
- ◆ Viewing angle: 120° horizontal, 100° vertical

\$1459

black
\$18.85 p/w

ViewSonic VX900 19" LCD MONITOR

- ◆ Full 19" Visible
- ◆ 1280x1024 optimum resolution Fh:30-82kHz, Fv:50-75 Hz
- ◆ CONTRAST RATIO: 600:1 (typ.)
- ◆ BRIGHTNESS: 250 cd/m² (typ.)
- ◆ Viewing angle: 170° horizontal, 170° vertical (typ)

\$2599

black / silver
\$31.19 p/w



SONY



PHILIPS

PHILIPS 107T 17" REAL FLAT CRT MONITOR

- ◆ 6" visible,
- ◆ 0.25mm dotpitch, 1280 x 1024 max res, 30-71kHz(h), 50-160kHz
- ◆ Win 95/98/NT 2000 compatible

\$299

PHILIPS 109P 19" REAL FLAT CRT MONITOR

- ◆ 19"(18" viewable) colour monitor, 0.24mm grille pitch
- ◆ 1920 X 1440 max res, 30-111kHz(h) 50-160kHz
- ◆ (v) scan rate, Win 95/98/NT/2000 compatible

\$899

\$11.62 p/w



ViewSonic

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13



Complete Output Solutions

Canon LIDE20

- ◆ 600 x 1200 dpi
- ◆ 48-bit input and 24-bit output
- ◆ Connect to Mac or PC
- ◆ USB Interface
- ◆ Powerful Imaging and OCR software



\$152

S300

- ◆ Up to 7.5 colour pages per minute in colour
- ◆ 11 black and white pages per minute
- ◆ Up to 2400dpi
- ◆ High speed modes also reduce ink consumption
- ◆ USB Interface for windows and Mac

Canon Special!



\$168

S520

- ◆ Up to 14 black 9 colour pages per minute
- ◆ Up to 2400 x 1200 print resolutions
- ◆ Creates prints without borders upto A4 size
- ◆ Superb quality with 5 picolitre ink droplets
- ◆ Connect to PC and Mac
- ◆ Replace all four ink tanks individually

Canon



\$355

S820

- ◆ 2 minutes for A4 Photos in 2400dpi
- ◆ Up to 2400 x 1200 print resolution
- ◆ Create full-bleed A4 borderless photos
- ◆ Connect to a PC or Mac
- ◆ Replace all six ink tanks individually

Canon



\$576

\$5.98 p/w

EPSON Perfection 1260/ 1260 Photo Scanner

- ◆ Up to 1,200 x 2,400dpi w/ Micro Slip Drive
- ◆ Scan size : 216 x 297mm (A4 + Letter)
- ◆ Colour : 24-bit (16.7 million colours) external, 48-bit (281,474 billion colours) internal
- ◆ Speed (Draft mode) : A4 300dpi: 43 sec Monochrome (Bi-level) & Colour
- ◆ Interface : USB 1.1 (Performance eqvt to USB 2.0 F)
- ◆ 35mm unit for slides and films for Perfection 1260 photo



Perfection 1260 1260 Photo Scanner

\$202

\$259

BJC 4650

- ◆ printing up to A3
- ◆ Automatic switching for Windows® and Macintosh®
- ◆ PhotoRealism
- ◆ Drop Modulation Technology™
- ◆ Image Optimiser
- ◆ Optional high-speed black ink cartridge for B&W printing
- ◆ Fluorescent ink option for signs and retail displays



\$399

Canon

C41UX/C41SX

- ◆ Up to 12 ppm black text (Memo) A4
- ◆ Up to 1440 dpi photo quality
- ◆ USB-enabled and complete with USB cable (STYLUS C41UX)
- ◆ Parallel port (STYLUS C41SX)
- ◆ Fast, easy set-up and operation

EPSON



C41UX \$112

C41SX \$159

C61

- ◆ 5760 x 720 Optimised DPI using RPM Technology
- ◆ 14 PPM Black and White
- ◆ Incredibly fine ink droplets at super fast speeds
- ◆ Win/Mac

EPSON Special!



\$199

Photo 830

- ◆ 6-colour ink system
- ◆ 5760 optimised dpi resolution
- ◆ Incredibly fine 4 picolitre ink droplets
- ◆ EPSON's PhotoEnhance 4 Image software and True BorderFree printing
- ◆ Print Image Matching Technology



EPSON

\$339

1290

- ◆ High speed throughput 4 pl Ultra Micro Dots at up to 2880dpi
- ◆ Over 20-year "lightfast prints"
- ◆ Feature-rich EPSON software included (latest version available from downloads)

EPSON



\$969

\$10.06 p/w

HP5550

- ◆ up to 4800 x 1200-optimized dpi
- ◆ add an optional automatic two-sided printing accessory and save up to 50 percent on paper costs and office file space
- ◆ smart-paper-type sensor automatically detects paper type and adjusts print settings for the best print quality

hp invent



\$259



Scan Jet 3500C

- ◆ Upto 1200 dpi and 48-bit colour
- ◆ preview scans in as little as 10 seconds
- ◆ HP's exclusive dual sensor CCD technology
- ◆ HP's CCD technology enables convenient and accurate scanning of 3-D objects



\$218

HP7150

- ◆ using advanced HP photorec IV color layering technology
- ◆ simply print photos from your computer, or from an HP Photosmart direct printing camera using front USB port
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DSCP31- 2.0 MP

- Zoom: 3x Precision Digital
- Minimum Focal Depth: 0.5m
- CCD: 1/2.7" 2100000 pixels
- Shutter Speed: 1/30 - 1/1000
- Sharpness Control: +/- 2
- Compression: JPEG/MPEG1
- Scene Selection: 3 modes
- Picture Effects: 4 modes
- LCD: 1.6" 61600 pixel
- Maximum Images: 1966 per 128MB Memory Stick



\$445

DSCP51- 2.1 MP

- Zoom: 2x Optical; 6x Digital
- Minimum Focal Depth: 0.8m
- CCD: 1/2.7" 2100000 pixels
- Shutter Speed: 1/30 - 1/1000
- Sharpness Control: +/- 2
- Compression: JPEG/MPEG1
- Scene Selection: 3 modes
- Picture Effects: 4 modes
- LCD: 1.6" 61600 pixel
- Maximum Images: 1966 per 128MB Memory Stick
- 3.2 Aspect Resolution: 1900 x 1072



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DSCP71- 3.2 MP

- Zoom: 3x Optical; 6x Digital
- Minimum Focal Depth: 0.5m
- CCD: 1/1.8" 3,300,000 pixels
- Shutter Speed: 1/30 - 1/2000
- Sharpness Control: +/- 2
- Compression: JPEG/MPEG1
- Scene Selection: 3 modes
- Picture Effects: 4 modes
- LCD: 1.5" 123,000 pixel
- Maximum Images: 1966 per 128MB Memory Stick



\$819

\$8.50 p/w

DSCP9- 4.0 MP

- Zoom: 3x Optical; 6x Digital
- Minimum Focal Depth: 0.5m (0.1m Macro)
- CCD: 1/1.8" 4,100,000 pixels
- Sharpness Control: +/- 2
- Compression: JPEG/MPEG1
- Scene Selection: 3 modes
- Picture Effects: 4 modes
- LCD: 1.5" 123,000 pixel
- Maximum Images: 1973 per 128MB Memory Stick
- 3.2 Aspect Resolution: 2272x1520



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DSCF707 - 5MP

5x Optical (10x Precision Digital) Zoom

- Minimum Focal Depth: 0.5m (0.02m Macro)
- Filter Diameter: 58mm
- Rotating lens (degrees): 77 degrees upwards - 36 degrees downwards
- CCD: 2/3" 5.24 Megapixels
- Shutter Speed: 1/8" - 1/1000
- Sharpness Control: +/- 2
- Compression: JPEG/GIF/IFF/MPEG1
- Scene Selection: modes: 3
- Picture Effects: 3
- LCD: 1.8" 123,200 pixel
- Maximum Number of Images: 240 per supplied 16MB Memory Stick and 1966 per 128MB optional Memory Stick



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DSCS85 - 4.1 MP

- Zoom: 6x Precision Digital (3x Optical)
- Minimum Focal Depth: 0.5m (0.04m Macro)
- CCD: 1/1.8" 4,133,000 pixel
- Shutter Speed: 8" - 1/1000
- Sharpness Control: +/- 2
- Compression: JPEG/GIF/IFF/MPEG1
- Picture Effects: 4
- LCD: 1.8" 123,000 pixels
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- 3.2 Aspect Resolution: 2272x1520



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PowerShot S40 4 Megapixel

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- CCD image sensor
- Canon 3x aspherical zoom lens
- LCD monitor, TFT Colour



PowerShot Digital IXUS 330 2.0 MegaPixel

- CCD records 1600 x 1200 pixels to capture even the finest details
- Movie recording with audio and playback up to 30 seconds
- 3 x optical zoom, combined with 2.5 x digital zoom to give a total of 7.5 x digital zoom, Auto focus
- Built-in flash
- LCD 1.5"



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PowerShot Digital IXUS-V2 2.0 MegaPixel

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- CCD records 1600 x 1200 pixels in large file mode
- Movie recording and playback up to 30 seconds
- 2 x optical zoom, combined with 2.5 x digital zoom to give a total of 5 x digital zoom



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PowerShot A40 2.0 MegaPixel

- 3x optical zoom, 7.5x with digital zoom - 35-105 / 35-210mm equivalent
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PowerShot A30 1.8 MegaPixel

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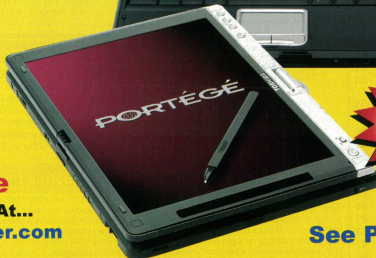
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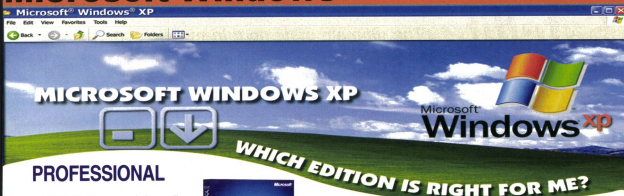
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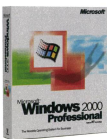
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Microsoft Windows 2000 Professional

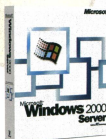


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VIDEO RAM	16MB	16MB
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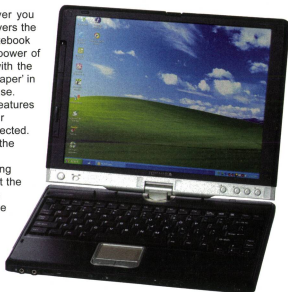
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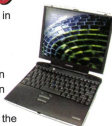
Rent* \$Call/wk (G4205) **\$Call**



Portégé 4010 Series

The Portégé® is the ultimate statement in mobile computing with its Pentium® III power, large high resolution colour display, long battery life and easy functionality all packed into an ultra thin lightweight body (only 2kg) finished in sleek magnesium. With head turning style and work burning performance, the Portégé® is the perfect tool for the travelling executive ready to succeed in the new world.

Rent* \$43.80/wk (E3499) **\$4,630**



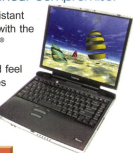
Tecra® 9100 Series

The most mobility & power without compromise!

The Tecra® series is equipped for constant mobile performance — providing you with the ultimate combination of traditional Tecra® investment benefits, high processor performance and a new sleek look and feel that you will notice. Each Tecra® comes with DVD drive standard.

For more details call Our Sales Team on 1300 13 9999 or visit

www.ht.com.au/cat/toshiba



Projectors TLP-B2 Ultra

This amazing compact projector has the profile of letter-size paper and weighs only 2.6kg. That means you can carry it with one hand and take it anywhere you go.

FEATURES:

- Full auto scanning for plug-and-play.
- Hook-up to any laptop or workstation.
- 1,250 ANSI lumens optical system.
- True XGA Resolution 1024 x 768.

Rent* \$53.51/wk (E3451) **\$5,799**



NO FURTHER DISCOUNTS AVAILABLE ON...

ALL TOSHIBA NOTEBOOKS & ACCESSORIES SOLD FROM **HARRIS TECHNOLOGY.**

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999
Fax: 1300 13 6666

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Email: sales@ht.com.au



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TOSHIBA

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/toshiba

Satellite Pro Models & Media Expansion

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

Delivery
Australia-wide

TOSHIBA Accessories

Black
USB Mini-
Mouse
(C1951)

\$57

Toshiba Port
Replicator
(D0406)

\$258

Mini PCI
Wireless LAN
Card
(E6784)

\$279

Toshiba
Air & Auto
Adapter
(F1207)

\$236

RENTSMART

The figures
quoted are
based on a
per week
basis over 3
years. T.A.P.
Terms &
Conditions
apply.

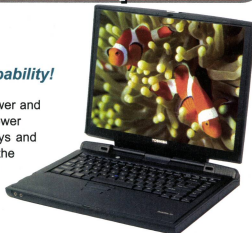
DEC

6

Satellite Pro®

Exceptional performance with wireless capability!

The Satellite Pro® series give you the best of both worlds — power and affordability. Built with just the right mix of features to let you power through day-to-day computing tasks with ease. Colourful displays and powerful processors provide plenty of CPU horsepower to even the most demanding applications, while the integrated multimedia devices never leave functionality behind.



Satellite Pro	TE-2100	TE-2100	6100	6100
PROCESSOR	P4 1.7GHz	P4 1.9GHz	P4 1.8GHz	P4 2.0GHz
RAM STD	256MB	256MB	256MB	256MB
HARD DRIVE	40GB	40GB	40GB	60GB
SCREEN	14.1" TFT	14.1" TFT	15" TFT	15" TFT
MAX RESOLUTION	XGA	XGA	XGA	UXGA(1600x1200)
CD-ROM/DVD	DVD	DVD/CD-RW	DVD/CD-RW	DVD/CD-RW
VIDEO RAM	16MB	16MB	32MB	32MB
56K v.90 & 10/100 LAN	yes	yes	yes	yes
WIRELESS LAN	Antenna	Antenna	Antenna only	Antenna + mini PCI
WARRANTY	1 year	1 year	1 year	1 year
Rent*	\$34.08/wk (G2444)	\$36.60/wk (G3287)	\$34/wk (G4208)	\$34/wk (G4209)
WINDOWS® 2000/ XP PRO	\$3,434	\$3,869	\$3call	\$3call

SD Media

With up to 128MB of capacity the small postage stamp sized SD card offers the easiest way to transfer data between devices. Fully compatible with the Toshiba Tecra® 9000, Portégé® 4000, Satellite Pro® 6000, Pocket PC e570, other models can accept SD memory via the PC card adapter.

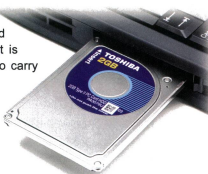


32MB SD Memory Card	(E0598)	\$107
64MB SD Memory Card	(E0600)	\$179
128MB SD Memory Card	(E0601)	\$327
PC Card SD Adaptor	(E6780)	\$164

2GB PC Card Hard Drive

Easily store and share information in a small and ultra portable device that is simple to use and easy to carry anywhere.

- 4200rpm
- Max 66.7MB/s transfer rate host
- Max 130MB/s transfer rate disk
- Average 15ms seek time
- 256KB buffer size
- Compatible with any PC equipped with a Type II PCMCIA PC Card slot
- Support for Windows® 95/ 98/ XP/ 2000/ NT
- 5mm x 54 mm x 86 mm
- Weighs only 55g



(D3427) **\$495**

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FINANCE METHODS ARE SUBJECT TO APPROVAL.

The Fujitsu LifeBook - "Made in Japan"

Fujitsu is renowned for delivering stylish, high performance, full-featured notebooks. Our LifeBook range is "Made in Japan" - your guarantee of reliability.

LIFEBOOK S6110 Ultra Slim

The ideal corporate notebook offering a host of hot swappable optional devices, large screen in an ultra slim form factor.

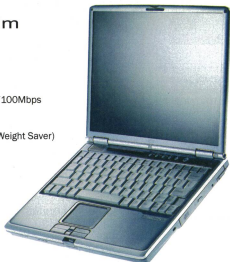
Microsoft® Windows® XP Professional is standard on the S6110.

- Hot Swappable Mobile Bay
- 13.3" XGA TFT Colour Display
- Integrated VGA (Max 48MB w/IDMS) with 3D Graphics Accelerator and MPEG-2 Support
- Integrated V.90 modem & 10/100Mbps Base-T LAN
- Port Replicator
- Approx. 1.74kg (with optional Weight Saver)

Processor	Pentium III 1.2GHz-M SS	Pentium III 1.2GHz-M SS
RAM	256MB	512MB
HDD	30GB	40GB
Drive	CD-RW	DVD/CD-RW
WLAN	Antenna Only	Yes- 802.11b
USB 2.0	Yes	Yes
Rent*	\$40.58/wk (G2456)	\$46.03/wk (G2466)
Part #		

\$4,289

\$4,988



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

FUJITSU

Accessories
Bluetooth card
(G2760)
\$298
S Series Port Replicator
(F7885)
\$198
Extended 3-Year Warranty
(F4383)
\$299

LIFEBOOK P1120 Ultra Portable

The **P1120** has the portability of a PDA, wireless capability and now also comes with **TOUCH SCREEN**. It is a fully-fledged notebook running **Microsoft® XP**.



- Integrated V.90 modem and 10/100Mbps Base-T LAN

Model	P1120	P1120
Processor	Crusoe 800MHz	Crusoe 800MHz
RAM	256MB	256MB
HDD	30GB	30GB
Drive	Ext CD	Ext CD
Screen	8.9" TFT TOUCH SCREEN	XP Pro
OS	XP Home	XP Pro
Rent*	\$33.73/wk (G4640)	\$35.72/wk (G4641)
Part #		

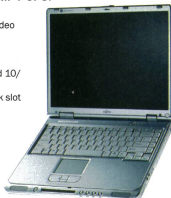
\$3,399

\$3,599

LIFEBOOK C2210 Multimedia

The multimedia desktop replacement utilising Intel's Pentium 4 CPU.

- ATI 32/64 Mb selectable video memory with 3D Graphics Accelerator and MPEG-2 Support
- Integrated V.90 modem and 10/100Mbps Base-T LAN
- Integrated SD/memory stick slot
- IEEE1394 FireWire
- Optical Digital Audio Out
- S-Video Out
- USB 2.0
- Microsoft Windows XP Professional also available



Model	C2210	C2210
Processor	P4 1.8GHz-M SS	P4 1.8GHz-M SS
RAM	256MB	256MB
HDD	30GB	40GB
Drive	CD-RW	DVD/CD-RW
Screen	14.1" XGA TFT	15" XGA TFT
OS	XP Home	XP Home
WLAN	No	Yes-802.11b
Rent*	\$31.75/wk (G4642)	\$33.73/wk (G4649)
Part #		

\$3,199 \$3,399 \$4,499

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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Ipx- First with Pentium® 4 3GHz

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for all your computer needs!



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The Ipx T400 is ideal for the small business user looking for a system with Pentium®4 technology that has superior performance and expansion capabilities!



Ipx recommends Microsoft® Windows® XP.

Internet keyboard optional upgrade.

IPEX INTEL® PENTIUM® 4 SYSTEMS

Form Factor	Altair T400 Tower	Altair T400 Tower	Altair T400 Tower
Processor	Intel® Pentium® 4 2.0GHz	Intel® Pentium® 4 2.4GHz	Intel® Pentium® 4 3GHz
RAM	256MB DDR	512MB DDR	512MB DDR
HDD	80GB @ 7200RPM	80GB @ 7200RPM	80GB @ 7200RPM
Multimedia	CD/RW, DVD	CD/RW, DVD	DVD- RW
Graphics	Onboard	GF4 MX440 64MB	GF4 TI4200 128MB
Sound	Onboard	Onboard	Onboard
LAN	Onboard	Onboard	Onboard
Modem	Internal 56K	Internal 56K	Internal 56K
Peripherals	Optical Mouse	Opt Mouse, Wireless K/B	Opt Mouse, Wireless K/B
Warranty	1 Year RTB	1 Year RTB	1 Year RTB
Microsoft® OS	MS Windows® XP Home	MS Windows® XP Home	MS Windows® XP Home
Microsoft® Software	MS Works 6.0	MS Works 6.0	MS Works 6.0
Monitor	17" CRT Screen	17" CRT Screen	15" TFT LCD Screen
Rent*	\$22.40/wk	\$25.75/wk	\$46.13/wk
Part #	(G4644)	(G0235)	(G4344)
	\$1,999	\$2,595	\$4,999
Monitor	15" TFT LCD Screen	15" TFT LCD Screen	
Rent*	\$25.75/wk	\$31.73/wk	
Part #	(G4645)	(G0328)	
	\$2,595	\$3,197	

Need to configure a PC to your own needs?
Call Harris Technology on 1300 13 9999

Upgrade your IPEX PC to the following Microsoft® software suites

Microsoft® Works Suite 2002

- Word 2002 • Excel Standard 2002
- Money 2002 • Picture It! Photo 2002

Microsoft® Office XP Small Business Edition

- Word 2002 • Excel 2002 • Outlook 2002
- Publisher 2002

Microsoft® Office XP Professional

- Word 2002 • Excel 2002 • Outlook 2002
- Publisher 2002 • Access 2002

Call Harris Technology on 1300 13 9999 for more information

IPEX LCD FLAT SCREEN MONITORS

IPEX 15" LCD

- Refresh Rates: Horizontal: 24 - 60Hz, Vertical: 56 - 85Hz • Resolution: 1024 x 768 @ 75Hz • Viewable display area: 307mm H x 230mm V • Multimedia with tilt & swivel base.

Rent* \$9.51/wk (C9400)

\$849

Images for illustration purposes only



IPEX 17" LCD

- Refresh Rates: Horizontal: 24 - 80Hz, Vertical: 56 - 85Hz • Resolution: 1024 x 768 @ 75Hz, 1280 x 1024 @ 60Hz • Viewable display area: 337mm H x 270mm V.

Rent* \$14.56/wk (C9401)

\$1,299



For all your short term computer hire needs

KWIKTRON
We have a vast inventory of the latest equipment is in-stock and ready for immediate delivery.

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

New NEC Servers

NEC Express 5800 Server 110Ef

NEC Express 5800 Server 110Ef P4 2.0GHz 256MB

- 110Ef Features Pentium 4 2.0GHz/512KB x 1
- 128 MB of PC133 SDRAM memory (Un-Buffered). Maximum 1.5GB.
- Up to 3 non hot-swap HDD bays.
- Standard IDE or optional SCSI Max 219.6GB (73.2GB x3) IDE RAID (0/1/5) can be configured with optional IDE disk array controller.

Rent* \$23.61/wk (G4483)

\$2,379



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.



**Fast
Delivery
Australia-Wide**

NEC Express 5800 Server 120Me

NEC Express 5800 Server 120Me Xeon 1.8GHz 256MB

- Pentium III Xeon
- 1.8GHz x 1 or 2 CPU
- 256 MB SDRAM memory (PC133), max 4GB
- HDD bays x10, max. 732GB (73.2GB x10) hot swap drives
- Support redundant power supply

Rent* \$75.29/wk (G4485)

\$8,459



NEC Server Promotion

Terms and conditions apply

Purchase any 2 processor capable Servers and receive Microsoft Windows 2000 Server (5 CAL) as a bonus.

or purchase any 4 way, 8 way or Blade Server products and receive Microsoft Windows 2000 Advanced Server (25 CAL) as a bonus. (promo software bundled with servers)

**Ask
About...**



NEC Express 5800 File Server Bundle

NEC Express 5800 File Server 110Ef

- Pentium IV CPU 2.0GHz
- 256MB RAM
- 60GB IDE HDD
- 3 year on-site warranty
- Microsoft Windows 2000 Server with 5 CAL

5 x NEC V730 MultiSync Monitor
3 year RTB warranty

5 x NEC Powermate ML4 PC

- Celeron 1.7GHz CPU
- 128MB RAM
- 20GB HDD
- CD ROM
- 10/100NIC
- Microsoft Windows XP Pro
- Internet Explorer 6.0
- Outlook Express 6.0
- Star Office
- 1 year RTB warranty

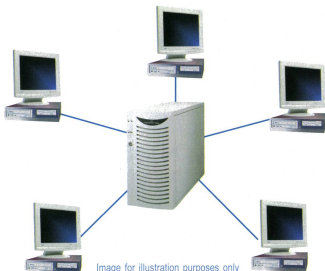


Image for illustration purposes only

Rent* \$91.81/wk (G4486)

\$10,950

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your short
term
computer
hire
needs**

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Notebooks

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Fly Buys.

Collect Fly Buys points on your computer hardware & software when you purchase from **HARRIS TECHNOLOGY.**



Fast Delivery Australia-Wide

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

*Terms and Conditions

Free items come bundled with purchased product. Offers end 31st Dec 2002.

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HARRIS TECHNOLOGY™

Compaq Evo N1015v Notebook

With Ultimate Free Power Pack!

- Mobile AMD Athlon XP 1200+
- 13.3" Colour TFT XGA display
- 20GB HDD
- 256MB DDR SDRAM + **Bonus 256MB** = 512MB total
- ATI 32MB Mobility Radeon 7500 video chipset
- 3.5" 1.44MB FDD
- 24x CD-ROM drive
- Integrated Mini PCI v.92/56K modem and ethernet
- Microsoft Windows XP Professional
- 1 year courier pick-up warranty

Free 256MB RAM*

Free 8-cell Li-Ion Battery*



Rent* \$22.77/wk (G2897) **\$2,295**

Compaq Evo N800v Notebook

Light weight mobile P4 notebook - only 2.6kg

- Mobile Pentium 4 1.7GHz-M with SpeedStep technology
- 15.0" Colour TFT 1400 x 1050 SXGA+ display
- 40GB HDD • optional 3.5" 1.44MB FDD
- 64MB video RAM
- 256MB DDR SDRAM + **Bonus 256MB** = 512MB total
- ATI 32MB Mobility Radeon 7500 video chipset
- CD-RW / DVD-ROM combo drive
- Integrated Mini PCI v.92/56K modem and NIC combo
- Microsoft Windows XP Professional
- 1 year courier pick-up warranty

Free 256MB RAM*



Rent* \$42.52/wk (F1846) **\$4,495**

Compaq Evo N1000c Notebook

Get mobile

- Mobile Pentium 4 1.7GHz-M with SpeedStep technology
- 14.1" CTFT 1024 x 768 display
- 30GB HDD
- 256MB DDR SDRAM, expandable to 1024MB
- ATI 32MB Mobility Radeon 7500, 64bit video graphics
- 3.5" 1.44MB Diskette drive
- 8x DVD-ROM drive
- Integrated Mini PCI v.92/56K modem and ethernet
- Microsoft Windows XP Professional
- 3 year courier pick-up warranty



Rent* \$37.77/wk (F1850) **\$3,992**

Compaq Evo N1000v Notebook

Great value in an all-in-one notebook

- Intel Celeron 1.5GHz processor
- 14.1" CTFT 1024 x 768 Display
- 20GB HDD
- 256MB DDR SDRAM, expandable to 1024MB
- ATI Mobility Radeon 7500 video chipset, 32MB DDR SDRAM, 4X AGP
- 3.5" 1.44MB FDD
- 8x DVD-ROM drive
- Integrated Mini PCI v.92/56K modem
- Microsoft Windows XP Professional
- 1 year courier pick-up warranty



Rent* \$27.73/wk (F1858) **\$2,794**



FINANCE METHODS ARE SUBJECT TO APPROVAL

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Complete Server Solutions

hp server tc2110 Series

hp server tc 2110 P4 2.0GHz 40GB IDE

- Intel Pentium 4 2.0GHz 400MHz FSB
- 128MB ECC SDRAM (1.5GB max)
- 48x CD-ROM
- 40GB IDE HDD
- FDD, dual-channel U33/66/100 IDE controller
- 3 PCI slots
- 10/100TX LAN
- 3 year limited warranty

Rent* \$20.12/wk (F9323)

 P5530A **\$1,795**

hp server tc 2110 P4 2.0GHz 18GB SCSI

- Intel Pentium 4 2.0GHz 400MHz FSB
- 128MB ECC SDRAM (1.5GB max)
- 48x CD-ROM
- 18GB Ultra3 SCSI HDD
- FDD, single-channel Ultra 3 SCSI controller
- 10/100TX LAN, 6 shelves
- 2 full-length PCI slots
- startup CD & toolkits for servers
- 3 year limited warranty

Rent* \$23.48/wk (F9321)

 P5529A **\$2,095**

hp server tc 2110 P4 2.0GHz 18GB SCSI with Windows 2000 Server preloaded, 5 CAL

- Intel Pentium 4 2.0GHz 400MHz FSB
- 256MB ECC SDRAM (1.5GB max)
- 48x CD-ROM
- 18GB Ultra3 SCSI HDD
- FDD, single-channel Ultra 3 SCSI controller
- 10/100TX LAN, 6 shelves
- 2 full-length PCI slots
- startup CD & toolkits for servers
- 3 year limited warranty

Rent* \$34.68/wk (G4369)

 P7740A **\$3,495**


Image for illustration purposes only.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

Ask About...



Compaq Services Carepack Upgrades:
Installation from Microsoft Operating System Application Telephone Support Pack-10 (D6479) **\$1,699**
Pack-25 (D6480) **\$4,285**

Compaq ProLiant ML310



Branch office solution

For growing businesses running sophisticated small applications and branch offices of larger organisations that need a platform for single-function solutions. Choosing a ProLiant server is making an investment in your company's future.

- Intel Pentium 4 2.0GHz or 2.2GHz processor
- 4GB DDR RAM maximum memory capacity
- Single-channel Ultra3 SCSI or dual channel ATA100 with integrated ATA RAID
- Standard 40GB ATA HDD or 18GB SCSI HDD
- 1 year warranty with optional upgrade to 3 years

 ML310 P4 2.0GHz 40GB ATA Rent* \$25.48/wk (G2487) **\$2,568**

 ML310 P4 2.0GHz 18GB SCSI Rent* \$30.42/wk (G2486) **\$3,065**

 ML310 P4 2.2GHz 40GB ATA Rent* \$27.48/wk (G2489) **\$2,769**

 ML310 P4 2.2GHz 18GB SCSI Rent* \$31.41/wk (G2488) **\$3,165**


Compaq ProLiant ML350 G3



Affordable 2-way performance

The affordable 2-way performance of the ML350 G3 delivers the perfect balance of price, performance and availability increasing workgroup productivity without breaking your budget.

- Intel Xeon 2.0GHz or 2.2GHz processors
- ServerWorks grand champions LE chipset
- PC2100 Advance ECC DDR SDRAM: 256MB standard on base models, 8GB max, interleaving capable
- Five expansion slots, four 64bit 100MHz PCI-X and one 32bit 33MHz PCI
- Tool-free quick deploy rails on rack models

 ML350 G3 2.0GHz Tower Model Rent* \$39.29/wk (G2741) **\$4,153**

 ML350 G3 2.0GHz Rack Model Rent* \$41.99/wk (G2743) **\$4,438**

 ML350 G3 2.2GHz Tower Model Rent* \$41.03/wk (G2744) **\$4,337**

 ML350 G3 2.2GHz Rack Model Rent* \$46.50/wk (G2745) **\$4,915**

- 3 year on-site warranty



Compaq ProLiant ML370 G3



Ideal for corporate environments

Integrated Virtual Presence and tool-free serviceability ideal for corporate environments!

The most versatile 2-way expansion server with industry leading management and serviceability for corporate data centers and remote sites.

- Up to two Intel Xeon 2.4GHz Processors
- 512MB DDR ECC RAM Standard (12GB Max)
- 6 open PCI-X 64bit/100 MHz slots
- Up to 8 hot plug hard drive bays
- iLO Integrated Lights-out management (remote management) on motherboard

 ML370 G3 P2.4GHz Tower Model Rent* \$52.29/wk (G2747) **\$5,667**

 ML370 G3 P2.4GHz Rack Model Rent* \$58.31/wk (G2748) **\$6,319**

- 3 year on-site warranty



For all your short term computer hire needs

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Kwiktron's vast inventory of the latest equipment is in-stock and ready for immediate delivery.

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hp Networks & Storage

NEXT BUSINESS DAY ADVANCE REPLACEMENT - LIFETIME WARRANTY
*****PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE ON ALL PRODUCTS*****

hp procure switch 5384 & 4148

J4888A hp procure switch 4148gl series is convergence-ready and easy to use in a compact 4-slot (3U) chassis with integrated power and 48 10/100-TX ports. Combined with HP's Fast Path Technology, which offers wire-speed switching of intra-module traffic, these switches provide high-performance and reliable connectivity for a growing network. The Switch 4148gl offers a low-cost, modular alternative to stackable switches and include free software upgrades and a lifetime warranty.



hp procure switch 4148gl
 Rent* \$56.83/wk
\$6,159
 (F1674)

J4849A hp procure switch 5348xl Designed to accommodate the most demanding network needs, the new HP Procure Switch 5300xl series delivers the fastest layer 2/3/4 switches for the price of competitor's layer 2 modular switches. The Switch 5348xl series offers scalable, layer 3 wire-speed switching in a compact, 4-slot modular form factor with a 76.8Gbps non-blocking crossbar switching fabric, 24mpps and pre-configured with 48 10/100 ports. The easy-to-use Switch 5300xl series is the latest in technology with unparalleled investment protection and lowest total cost of ownership



hp procure switch 5348xl
 Rent* \$76.93/wk
\$9,175
 (E8120)

hp procure switch 2124, 2512 & 2524

J4868A hp procure switch 2124 Low-cost, unmanaged 24-port switch with 10/100-TX autosensing per port and one open transceiver slot for 100Base-FX uplink. The HP Procure switch 2124 offers HP Auto-MDIX on all 10/100-TX ports and is ideal for low cost unmanaged connectivity.



hp procure switch 2124
 Rent* \$12.95/wk (D1512) **\$1,156**

J4812A hp procure switch 2512 The Hewlett-Packard ProCurve 2512 is a high-speed 12-port managed switch with 2 transceiver slots, offering high performance, security, easy management, and some advanced features at an affordable price. The optional transceivers give you the flexibility of adding Gigabit Ethernet or 100-Mbit fibre.



hp procure switch 2512
 Rent* \$19.04/wk (A9703) **\$1,699**

J4813A hp procure switch 2524 The Hewlett-Packard ProCurve 2524 is a high-speed 24-port managed switch with 2 transceiver slots, offering high performance, security, easy management, and some advanced features at an affordable price. The optional transceivers give you the flexibility of adding Gigabit Ethernet or 100-Mbit fibre.



hp procure switch 2524
 Rent* \$24.60/wk (B0062) **\$2,195**

NEW! HP Storage

C5686A, C5687B hp Surestore dat 40 The HP Surestore DAT40 addresses the evolving backup needs of an exceptionally wide range of organisations and networks. It features a ground-breaking combination of speed and reliability in a cost-effective 40 GB backup for servers and workstations



C5686A
 Internal Rent* \$23.48/wk
 (83310) **\$2,095**
 C5687B
 External Rent* \$25.45/wk
 (G2477) **\$2,565**

C7400A, C7401B hp Surestore Ultrium 230 This ultra-fast LTO drive stores 100 GB (native capacity) of data on a single tape. With a transfer rate of up to 108 GB/hr the HP Surestore Ultrium 230 delivers the best performance even when the server can't match the drive's speed, by adjusting the tape speed to optimise data streaming. The Ultrium 230 now comes with HP One-Button Disaster Recovery (OBDRe) software.



C7400A
 Internal Rent* \$78.17/wk
 (C4269) **\$9,323**
 C7401B External Rent* \$83.63/wk
 (G2480) **\$9,974**

hp StorageWorks SDLT 160/320 GB Tape Drive Offering 160GB native capacity, and 16MB/s transfer rate, businesses can lower total costs of ownership by reducing the number of data cartridges required and by shrinking the backup window for business-critical data. In addition, backward-read compatibility to existing DLT and SDLT-based solutions provides the highest level of investment protection while offering a smooth transition path to new SDLT 160/320-based data protection solutions.



Internal Rent* \$82.37/wk
 (G2730) **\$9,824**
 External Rent* \$90.35/wk
 (G2481) **\$10,775**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

hp procure switch 408
 Unmanaged 8 port 10/100 switch in a compact sized package. This switch offers half/full duplex, 10/100 autosensing on every port.
 Lifetime Warranty: with Next Day Exchange

(C9017)
\$385

Web Direct

See Web Direct Link

(at top of page) for more products and latest info!

DEC

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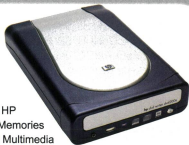
Create Preserve and Share

hp DVD Writer 200e

The most advanced portable storage device

- DVD – 2.4x write, 2.4x re-write, 8x read
- CD – 12x write, 10x re-write, 32x read
- Buffering – 2MB
- Interface – external, IEEE 1394 (or Firewire) / USB 2.0

Software included – HP MyDVD Video by Sonic, ArcSoft Showbiz, HP RecordNow, HP DLA and HP Simple Backup powered by Veritas, HP Memories Disc Creator, PowerDVD by CyberLink, MusicMatch Jukebox, ArcSoft Multimedia Email.



Rent* \$14.11/wk (F1791) **\$1,259**

hp DVD Writer 200i

The new generation storage technology

- DVD – 2.4x write, 2.4x re-write, 8x read
- CD – 12x write, 10x re-write, 32x read
- Buffering – 2MB
- Interface – internal, 40pin IDE/ATAPI

Software included – HP MyDVD Video by Sonic, ArcSoft Showbiz, HP RecordNow, HP DLA and HP Simple Backup powered by Veritas, HP Memories Disc Creator, PowerDVD by CyberLink, MusicMatch Jukebox, ArcSoft Multimedia Email.



Rent* \$11.19/wk (F1751) **\$999**

Compaq iPAQ Pocket PC H3970

The No.1 Pocket PC now with inbuilt Bluetooth for wireless communication

- Intel 400MHz X-Scale
- 64MB RAM, 48MB ROM
- Integrated Bluetooth
- Increased battery life
- Integrated SD slot - SD input/output ready
- Ultrabright transfective TFT screen with 65K colours
- Includes: universal (USB/Serial) docking cradle, AC adaptor
- Microsoft® Pocket PC 2002

Mobility pack includes: thumbpad keyboard, combo case, synch auto-charger cable, one replacement stylus, screen protector and cloth.

Free Mobility Pack*

*Terms and Conditions
Free Mobility Pack comes bundled with purchase of iPAQ H3970. Offer ends 31st Dec 2002.



Rent* \$15.68/wk (F4394) **\$1,397**
Includes accidental damage cover!

Compaq iPAQ Connection CP-2W

Share high speed internet with built-in firewall security and wireless freedom!

- Cable/DSL broadband internet ready
- Wireless LAN (IEEE 802.11b)
- 4 port setup fast ethernet switch
- Built-in security with NAT firewall, WEP data encryption & address filtering VPN pass-through
- Free 12 months phone based installation and configuration support until 31st January 2003.



(G4446) **\$495**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
*Delivery charges extra.

DVD Media



hp DVD+R media single with jewel case (G0318) **\$13**



hp DVD+RW media single with jewel case (D4024) **\$28**

iPAQ Accessories

Auto Adaptor (D9174) **\$65**

Premium Leather Case (E3492) **\$125**

Universal Cable serial / USB (D9171) **\$45**

WL110 Wireless LAN PC Card (C3284) **\$192**

WL215 USB Wireless LAN Client for desktops (C3296) **\$255**

PC Card Expansion pack (F5094) **\$230**

Secure Digital (SD) Memory Card 64MB (F0567) **\$185**

CompactFlash (CF) Memory Card 64MB (G4415) **\$167**

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SONY

RENTSMART

The figures quoted are based on a per-week basis over 3 years. T.A.P. Terms & Conditions apply.

Prices are subject to change. Check here for latest prices & products!!

Web Directwww.ht.com.au/cat/sony

Portable Digital Solutions

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
*Delivery charges extra.

Flat Display Trinitron Monitors

CPDG420 - 19" FD Trinitron display
•0.24-0.25mm Aperture Grille •USB Hub
•15 Pin Mini D-sub input •5 BNC input
•Monitors include 3 year warranty.

Rent* \$11.19/wk (B7964) **\$999**

CPDG520 - 21" FD Trinitron display
•0.24mm aperture grille •USB Hub •15 Pin Mini D-sub Input •5 BNC input •Monitors include 3 year warranty.

Rent* \$22.12/wk (B7966) **\$1,974**

Video Cameras

**MEMORY STICK****Bonus Battery with DCRTRV340, DCRTRV18**

DCRTRV18 - MiniDV Handycam, Carl Zeiss lens, Memory Stick slot, USB streaming, MPEG Movie mode, advanced HAD technology, 2.5" LCD monitor.

Rent* \$17.92/wk (F5209) **\$1,599**

DCRTRV340 - Digital 8 Handycam, 25x optical zoom, Memory Stick slot, USB streaming, MPEG Movie mode, electronic steady shot, super night shot.

Rent* \$15.52/wk (F5211) **\$1,385**

Valid from 1st Dec 2002 to 31st Dec 2002.
FREE item comes bundled with purchased product.

Digital Still Cameras Cyber-shot

**MEMORY STICK**

DSCP51 - 2.0MP, 2x Optical, 6x precision digital zoom, MPEG Movie HQX, E-mail mode, Intelligent flash (red-eye reduction), white balance (auto, daylight, cloudy), USB Interface.

Rent* \$7.05/wk (G4618) **\$629**

DSCP31 - 2.0MP, 3x digital zoom, 1.6" LCD screen, MPEG Movie HQX, clip motion, NiMH battery system, USB.

(F1093) **\$499**

DSCP7 - 3.2MP, 3x optical (6x digital) zoom, 1.5" LCD screen, MPEG Movie HQX, ISO sensitivity setting, AF illuminator, USB.

Rent* \$12.31/wk (G4620) **\$1,099**

DSCP71 - 3.2MP, 3x optical (6x digital) zoom, 1.5" colour LCD, MPEG Movie HQX, ISO sensitivity setting, AF illuminator, USB.

Rent* \$10.07/wk (G4619) **\$899****Bonus 16MB Memory with DSCP51, DSCP71.****Bonus 32MB Memory with DSCP7**

Valid from 1st Dec 2002 to 31st Dec 2002.
FREE item comes bundled with purchased product.

DVD+R/RW and -R/RW in One Drive

DVD +R/RW and -R/RW in One Drive
Records and Plays both DVD's and CD's

Compatible with both DVD +R/RW and -R/RW formats

Suitable for both Audio/Video and data storage applications

Supplied with an extensive software suite, media, install and user guide.

DRU500A - Internal IDE version

Rent* \$9.96/wk (G3658) **\$889**

DRX500UL - External i.LINK/FireWire and USB2 interfacing.

Rent* \$14.19/wk (G3657) **\$1,266**

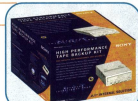
AIT IDE Back-Up Kit

Internal IDE interface
Storage: 35 - 90GB
Helical Scan Recording
AME Based Media
MIC Technology
Up to 40GB per Hour

Supplied with: Retrospect Back-Up Software, Media, Installation Guide and interface cable.

**Advanced Intelligent Tape**

SDX420B.

Rent* \$18.00/wk (F9899) **\$1,606**

Memory Stick and Floppy Disk Drive

Memory Stick Slot
Floppy Disk Drive
USB 2.0 interfacing
Small, Light and Portable

**MEMORY STICK**

MSFD20U.

(G4553) **\$149**

SONY USB Storage Device MICRO VAULT



Plugs directly into a USB Port. Plug and Play interface, Security Zone software allows password protection of data when using Windows® 2000 & XP.

USM16
16MB RAM (E4136)

\$49

USM32
32MB RAM (pictured) (E4140)

\$73

USM64
64MB RAM (E4141)

\$117

USM128
128MB RAM (E4142)

\$195**DEC****14****HARRIS TECHNOLOGY™**

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.



SONY

RENTSMART

*The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/sony

VAIO Notebooks and Clie PDA's

VAIO DVD ROM **disc** DRIVE

PCGFXA10

Bonus Carry Bag until 31st Dec, 2002

Rent* \$28.77/week (G2280)

\$2,899



- MS XP Home Edition
- 30GB HDD, 256MB RAM
- 8MB video memory
- Modem & network

VAIO DVD ROM **disc** DRIVE

PCGGRX5P

Rent* \$48.90/week (G4616)

\$5,299



- Pentium 4, 2.0GHz -M
- CD-RW/DVD combo drive
- 16.1" UXGA display
- USB & i.LINK interface
- MS XP Professional
- 512MB RAM, 60GB HDD
- Memory stick slot
- Modem & network

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY

*Delivery charges extra.

VAIO DVD ROM **disc** DRIVE

PCGR505TFP

Bonus Carry Bag until 31st Dec, 2002

Rent* \$40.67/week (G2281)

\$4,299



- Ultra portable and stylish
- 12.1" XGA display
- Integrated wireless LAN
- CD-RW/DVD-ROM drive
- Docking Station
- MS XP Professional
- 60GB HDD, 256MB RAM
- Modem & network
- USB & i.LINK interface

VAIO DVD ROM **disc** DRIVE

PCGC1MT1

Rent* \$37.83/week (G2437)

\$3,999

CD-RW / DVD-ROM Drive Supplied



- Built-in camera
- MagicGate memory stick slot
- Port replicator supplied
- 8.9" SXGA display
- Internal modem
- Lightweight 995g

VAIO

Software included with Notebooks:*

- Norton AntiVirus 2002
- Adobe Photoshop Elements
- Apple Quicktime
- Adobe Acrobat Reader
- Movie Shaker
- PictureGear
- DVgate
- SonicStage

*Notebook PartNo: (G2437), (F8191) (G2280), (G2281)

CLIE **MAGICGATE** **MEMORY STICK**

PCGNR70VG

Bonus Case until 31st Dec, 2002

Built-in camera

Built-in keyboard

Built-in AT-RAC3 & MP3 player

Flip rotatable LCD display

320 x 480 hi-res colour display

MagicGate Memory Stick slot

Rent* \$14.00/week (F0918)

\$1,249



CLIE **MAGICGATE** **MEMORY STICK**

PEGT665CG

Ultra slim design

Built-in AT-RAC3 & MP3 player

Earphones supplied

320 x 320 colour display

MagicGate memory stick slot

Rent* \$9.51 /week (F5201)

\$849



CLIE

Software Supplied with CLIE:*

- World Alarm Clock
- Clie Paint
- gMovie
- PictureGear Pocket
- Photostand
- Intellisync Lite
- Documents to go

*CLIE PartNo: (F0918), (F5201) (F9402), (F9401)

CLIE **MAGICGATE** **MEMORY STICK**

PEGSJ20G

Compact style

320 x 320 monochrome display

Memory stick slot

Jog dial

USB

Infra-red

(F9402)

\$449



CLIE **MAGICGATE** **MEMORY STICK**

PEGSJ30G

Compact style

320 x 320 colour display

Memory stick slot + Jog dial

USB

Infra-red

Rent* \$7.27/week (F9401)

\$649



DEC

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999
Fax: 1300 13 6666

Web: www.ht.com.au
Email: sales@ht.com.au



Order on-line
www.ht.com.au

Power Back Up = Power Protection

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.



PNote Pro
(99592)

\$45



Surge Arrest 5 Strip
(A0098)

\$55



APC Symmetra
Power Array
8kVA, exp. to
16kVA
(71087)
Rent*

\$113.44/wk

\$13,995
So good we use it ourselves!

APC Back-UPS ES 350/500



The new APC Back-UPS ES 350/500 is designed as an affordable battery backup to provide continued uptime and hardware protection for home and home office computer users. This product has five Australian style outlets (three battery and surge, two surge only outlets), new attractive flat design, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications and ships with file saving and auto-shutdown software. Comes with 2 years product warranty.

Back-UPS ES 350va (E1093) **\$185**

Back-UPS ES 500va (E0709) **\$235**

APC Back-UPS Pro® for Workstations



Smart battery backup & high performance surge suppression for Windows 95 & NT PCs

PowerChute® Plus software lets your UPS shut down your applications gracefully in the event of an extended power failure. Includes additional output for protection of printers, audible alarms, phone/modem protection, user replaceable hot swappable batteries.

APC Back-UPS Pro 280si (76636) **\$257**

APC Back-UPS Pro 420si (76637) **\$349**

APC Back-UPS Pro 650si (76638) **\$485**

APC Smart-UPS with USB Support



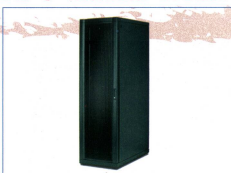
Smart-UPS 1000VA, 1500VA

Smart-UPS protects your data by supplying network-grade battery backup when power fails. With PowerChute® Plus software the uninterruptible power supply (UPS) will safely store data and shut down your network operating system before the battery is fully discharged, whether you're there or not. SmartSlot internal accessory slot allows you to install optional accessories to enhance the performance of your UPS. APC Smart-UPS is the perfect UPS for file servers, minicomputers, UNIX CPU's, Internet hubs, telecommunications systems and other mission-critical applications.

APC Smart-UPS 1000VA Rent* \$11.04/wk (D9337) **\$985**

APC Smart-UPS 1500VA Rent* \$14.53/wk (D4218) **\$1,297**

APC NetShelter VX Black 42U Premium Equipment Enclosure



Next generation, high quality enclosure solutions designed to meet the needs of today's and tomorrow's networking environment.

Features:

Adjustable mounting depth, casters, cold rolled steel, computer grade ventilation, leveling feet, lockable doors and side panels, powder coat, removeable doors and side panels, rolls through 7 ft door, roof and base cable access, ships fully assembled, equipment mounting hardware, keys, user manual.

Rent* \$31.01/wk (E4994) **\$3,125**

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Intelligent KVM and USB Products

ServerLink LCD KVM Switches

With a 15" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.

SERVERLINK LCD



- LKS-101** 1U Console Drawer 15" TFT LCD, KB & mouse
- LKS-801** 8 port 1 User KVM - LCD, KB & mouse in 1U drawer
- LKS-802** 8 port 2 User KVM - LCD, KB & mouse in 1U drawer
- LKS-1602** 16 port 2 User KVM - LCD, KB & mouse in 2U drawer

- Rent*\$40.34/wk (F7677) **\$4,264**
- Rent*\$45.21/wk (E7463) **\$4,779**
- Rent*\$46.50/wk (F7678) **\$5,039**
- Rent*\$52.49/wk (F7679) **\$5,688**



INTEGRATED KVM SWITCH

ServerLink SOHO KVM Switches

SERVERLINK SOHO



INCLUDES ALL CABLES!

- SL-251-P** 2 port ServerLink inc. 2 x 2m PS2/VGA cables (E3692) **\$199**
- SL-451-P** 4 port ServerLink inc. 4 x 2m PS2/VGA cables (E3694) **\$299**

Serverlink Infinity KVM Switches on-screen-display

SERVERLINK INFINITY



- SL-221** 2 port ServerLink KVM for PS2 (B3047) **\$269**
- SL-421** 4 port ServerLink KVM for PS2 (A9890) **\$349**
- SL-821** 8 port ServerLink KVM for PS2 (E3692) **\$599**
- Rent*\$10.97/wk (97888) **\$979**
- SL-1621** 16 port ServerLink KVM for PS2 (E3694) **\$1,599**
- Rent*\$17.92/wk (97890)



Comsol USB Storage Drives

FEATURES PASSWORD SECURITY

- UT-0016** 16MB Drive (G0943) **\$75**
- UT-0032** 32MB Drive (F7691) **\$95**
- UT-0064** 64MB Drive (F7692) **\$137**
- UT-0128** 128MB Drive (F7693) **\$235**
- UT-0256** 256MB Drive (F7694) **\$466**
- UT-0512** 512MB Drive (G0944) **\$789**



Comsol USB Mini Hubs

These USB Mini Hubs are small & lightweight and perfect for both notebooks & desktops

- UH-201M** 2 Port USB 1.1 Mini Hub (G1939) **\$28**
- UH-401M** 4 Port USB 1.1 Mini Hub (G1940) **\$39**



Comsol USB 2.0 Hub - 480MBps

Connect your High-Speed USB 2.0 peripherals to your PC. Backward compatible with USB 1.1 Products.

- UH-402** 4 Port USB 2.0 Hub (G1938) **\$88**



Comsol 4 Port USB 2.0 Cardbus

Instantly add 4 USB 2.0 ports to your notebook and take advantage of transfer speeds of up to 480Mbps.

- UCB-402** 4 Port USB 2.0 Cardbus Adapter (G4199) **\$95**



Comsol USB Infrared Adapter

Ideal for wireless data transfer between desktop PC and notebook, PDA or mobile phone.

- UIR-100** USB to IrDA Wireless Adapter (D8944) **\$129**



Comsol USB Docking Station

- UDS-100** Includes 2 x USB 1.1 Ports, 2 x PS/2 Ports, Printer Port, Serial Port & 10/100 Ethernet (G1942) **\$223**



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

USB Video Capture Adapter



- UV-100** USB to Analogue Video Adapter (G1943) **\$149**

USB to PS/2



- UKMC-100** USB to PS/2 Keyboard & Mouse Adapter (B0557) **\$69**

USB to Serial Converter



- UMC-100** USB to 9 Pin RS232 Serial Converter (80782) **\$69**

Networking & Communications Converged

Get your Communications working over Christmas

NETCOMM ADSL

Specially designed to work with all major Australian ISPs. Super-fast internet connection allows speeds up to 8Mbps download and 1Mbps upload.

***Special pricing is exclusive to Harris Technology for the month of December only!**



***SPECIAL PRICING!**

NB1200 (F8602) **\$199**
Bundle includes Micro Filter

NB1300 ADSL Ethernet Modem Router

Connecting your SOHO or small business network to an ADSL service has never been easier. NetComm's NB1300 with it's in-built ADSL 10/100 ethernet modem and router delivers simultaneous ADSL services to local network users. The ADSL router supports IP packet routing and functions such as NAT and DHCP allowing users to have their IP address assigned automatically and share a single ISP account.



(G4025) **\$299**

HOT NEW PRODUCT

NB3300 ADSL Modem Router

- 4-port 10/100 switch
- Easy web interface
- NAT security and internet sharing
- Built-in ADSL modem
- Supports PPPoA, PPPoE, PPTP and bridged protocols.
- IP port filtering, IPsec passthrough, remote access, DMZ hosting, DHCP

NB3300
(F3590) **\$432**



NETCOMM CABLE / DSL ROUTERS

NB3000 Cable / DSL Wireless Router

- Built-in Telstra cable connection
- 4-port 10/100 switch
- Easy web interface
- NAT security and internet sharing
- Wireless range >90 metres indoors

NB3000
(F3588) **\$468**



NB3100 Cable / DSL Firewall Router

- 4-port 10/100 switch
- Easy web interface
- SPI (Stateful Packet Inspection Firewall)
- Supports Denial of Service and URL filtering
- Can block all Java, ActiveX code and cookies
- Supports VPN, IPsec and PPTP pass through
- Supports up to 2 simultaneous VPN tunnels

NB3100
(F3589) **\$285**



NB3200 Cable/DSL VPN Router

- 4-port 10/100 switch
- Easy web interface
- NAT security and internet sharing
- Provides full IPsec VPN tunnelling and firewall protection
- Supports up to 70 simultaneous VPN tunnels

NB3200
(F3586) **\$425**



NETCOMM 802.11b WIRELESS NETWORKING

1 x NP7000 11Mbps wireless LAN access point

(D4196) **\$439**

1 x NP7030 11Mbps wireless LAN PCMCIA

(D4198) **\$179**

1 x NP7040 11Mbps wireless LAN USB adaptor

(D4199) **\$194**



ALL THIS FOR

Rent* \$7.79/wk

(G2100) **\$695**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

NETCOMM FAST ETHERNET ADAPTORS

NP1100-4
High performance 32-bit 10/100 PCI LAN card (E7333) **\$19**

NP1010
USB LAN key 10/100 fast ethernet adaptor (C7651) **\$69**

NP1200
10/100 fast ethernet 32-bit PC Card with TruConnect technology (D1166) **\$99**

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.



Award Winning Global Leader

EtherFast® Cable/DSL Router + 8-Port Switch

Inexpensive way to share your one Internet IP address over your entire network? **NEW**

- SNMP Provides Port Security, Packet Filtering, IP Multicast, and Filters Internal User's Access
- Full Wirespeed Layer Two Switching on All LAN Ports
- Administrators Can Block Specific Internal Users' Internet Access
- Supports WinSock 2.0 and Windows 2000 Smart Applications



BEFSR81 (F9052) **\$295**

EtherFast® Cable/DSL Router **NEW**

Connect your network to your high-speed cable or DSL Internet pipeline with the ultimate in Security and Control

- Connects to a broadband modem and 10/100 ethernet backbone • Use just one IP address to access the Internet over your entire network
- Configurable through your networked PC's web browser
- Remote administration and remote upgrades over the Internet • Internal 4-port switch dramatically speeds up your gaming and multimedia connections • Administrators can block specific internal users' internet access with filtering • 1 year limited warranty.



BEFSR41 (A0203) **\$159**

HOT Price

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
"Delivery charge extra."

Instant USB Disk™

Pocket-sized data storage with easy USB access

- Complies with USB specification 1.1 • USB plug and play connectivity • Compatible with Windows 98SE, 2000, Me or XP
- Bus powered - no external power supply or battery required
- Hot swappable and cable free convenience • Durable, shock resistant, solid state storage • Retains data for at least 10 years • Compact, sleek design with pocket clip and keychain hole.



USBM32M 32MB (F9118) **\$109**

USBM64M 64MB (F9119) **\$139**

Instant Wireless™ PCI Card

Network your wireless PC

- 11Mbps high speed transfer rate • Compatible with most major operating systems • Plug and play operation provides easy setup • Works with all standard internet applications
- Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment • Capable of up to 128Bit WEP encryption • Free software driver upgrades • 1 year limited warranty.



WMP11 (F8678) **\$249**

Instant Wireless™ Network PC Card

The freedom to work where you want. The flexibility to work how you want.

- 11Mbps high speed transfer rate • Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment • Plug and play operation provides easy set up • Long operating range (up to 120m indoor)
- Advanced power management features conserve valuable notebook PC battery life • Rugged metal design with integrated antenna • Works with all standard Internet applications • Automatic load balancing and scale back • Full 1 year warranty.



WPC11 (F8681) **\$178**

EtherFast™ 10/100 Switches

Enjoy full-duplex, dedicated bandwidth in a new compact, modular design

- Ideal for integrating your 10BaseT and 100BaseTX network hardware • 5, 8 or 16 10/100 ports provide dedicated bandwidth in half or full duplex modes • Switched 10/100 ports run at 10Mbps, 20Mbps, 100Mbps or up to 200Mbps • 5 year limited warranty.



EZXS55W 5 Ports (F9068) **\$98**

EZXS88W 8 Ports (F9070) **\$165**

EZXS16W 16 Ports (F9071) **\$275**

Wireless Access Point Router with 4-Port Switch

Connect your wired and wireless networks to the broadband Internet

- Capable of up to 128-Bit WEP encryption
- Supports enhanced security using NAT Firewall, ZoneAlarm Pro, and PC-cillin software • Administer and upgrade the router remotely over the Internet
- Configurable as a DHCP server on your network • Advanced security management functions for port filtering and DMZ hosting • Includes one ethernet cable to connect to a cable or DSL modem • 1 year limited warranty.



BEFW11S4 (F8745) **\$429**

Instant Wireless™ Network Access Point

The latest in wireless technology. The ultimate in network flexibility.

- High speed transfer rate of up to 11Mbps
- Interoperable with IEEE 802.11b (DSSS) 2.4GHz compliant equipment • Adjustable antennas provide for physical configuration • Wireless access point roaming and bridging • IP Filtering, DHCP client and SNMP configuration utility password protection • 128bit hardware WEP supported • 1 year limited warranty.



WAP11 (C3175) **\$339**

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See
Web
Direct
Link
(at top of page)
for
more
products
and
latest
info!

Fast
Delivery
Australia-
Wide

DEC

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NETGEAR™

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/netgear

Everybody's Connecting

switches

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
*Delivery charges extra.



Network Cards

FA 311
Ethernet adaptor
10/100Mbps PCI
(A1372)
\$32

FA 312
10/100Mbps wake on LAN ethernet adaptor
(A1373)
\$42

FA 411
10/100Mbps PC card (No dongle required)



(B9944)
\$115

FA511
10/100Mbps CardBus PC card (No dongle required)
(D4112)
\$120



FS 524
24 Port 10/100Mbps
Rent* \$9.29/wk (77549) **\$829**

FS 105

FS 108

FS 116

5 Port 10/100Mbps

8 Port 10/100Mbps

16 Port 10/100Mbps

(B4722) **\$138**

(70905) **\$208**

(A5347) **\$399**

FS 516

16 Port 10/100Mbps
Rent* \$7.38/wk (60522) **\$659**

FS 524S (Stackable)

24 Port 10/100Mbps
Rent* \$17.80/wk (B6540) **\$1,588**

Modular Solutions

Unmanaged Non-blocking 19" units provide 24 or 48 10/100Mbps, auto-sensing ports with Auto Uplink™ support.



FS726 24 Port

10/100Mbps,
2 module slots.
Rent* \$12.61/wk
(D0873) **\$1,125**

FS750 48 Port

10/100Mbps,
2 module slots.
Rent* \$24.36/wk
(D0874) **\$2,174**

AG711T

Gigabit copper
module.
Rent* \$7.56/wk
(D0921) **\$675**

AG711F

Gigabit fibre
module.
Rent* \$10.58/wk
(D0924) **\$944**

Gigabit Solutions

Ideal for combining 10, 100 and 1000 Mbps unmanaged devices, automatic speed and full/half duplex sensing plus Auto Uplink™ on every port



GS104 4 Port

10/100/1000Mbps
gigabit ethernet switch.
Rent* \$13.39/wk
(F7306) **\$1,195**

GS 508T 8 Port

10/100/1000Mbps
gigabit switch.
Rent* \$23.57/wk
(B9916) **\$2,375**

GS516T 16 Port

10/100/1000Mbps
gigabit switch.
Rent* \$36.61/wk
(D5960) **\$3,689**

GS524T 24 Port

10/100/1000
gigabit switch.
Rent* \$44.42/wk
(D5961) **\$4,695**

Managed Solutions

Use built-in Copper Gigabit or GBIC slots. Management includes SNMP, RMON, VLAN, QoS, Port Trunking, Spanning Tree, and Port Mirroring.



FSM 726S

Managed 24 Port

10/100Mbps switch with 2
stacking ports and 2x GBIC slots.
Rent* \$23.48/wk
(D8885) **\$2,095**

GSM 712

Managed 10 port

10/100/1000Mbps switch
with 2x GBIC slots.
Rent* \$37.00/wk
(F4112) **\$3,728**

FSM 750S Managed 48 port

10/100 Mbps switch

with 2 stacking ports and

2x GBIC slots.

Rent* \$30.14/wk
(G4121) **\$3,037**

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print servers

The utmost in simplicity and cost-effectiveness. The special-purpose print servers enable you to connect your printers to a network using the parallel port.



PS 111W 1 port
wireless ready print
server.
(E5833) **\$209**



PS 101
1 port mini print
server.
(E5832) **\$185**

PS 110 10/100Mbps
print server, 2 parallel
ports.
(67226) **\$269**

PS 113 10/100Mbps
print server, 3 parallel
ports.
(A3287) **\$357**

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routers

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The NETGEAR range of routers, gateways and firewalls provide simple and secure connectivity to the Internet for both small business and branch offices. All products have NAT firewall security, DHCP and easy installation via web based configuration. VPN pass through is supported on all routers and VPN end point termination is available on certain products. www.netgear.com.au offers specific installation information to suit the Australian market.

DM 602

High speed ADSL modem with both ethernet and USB connectivity.



(F9650)

\$299

RP614

Cable/DSL web safe router gateway with 4 port 10/100Mbps switch.



(F9645)

\$228

DG814

Integrated DSL modem and router with 4 Port 10/100Mbps switch.



(F5181)

\$420

FVS318

Cable/DSL ProSafe VPN firewall with 8 port 10/100Mbps switch.



(F0242)

\$453

FR114P

Cable/DSL ProSafe firewall router with integrated 4 port 10/100 switch and print server.



(F0902)

\$295

GA 302T

32 bit PCI Gigabit Network Card (D4118)

\$97

GA 622T

32/64 Bit PCI Gigabit Network Card (B9943)

\$276



wireless

NETGEAR offer a comprehensive range of standards based wireless products ranging from the popular 802.11b 11 Mbps products to the blazing speeds offered by 802.11a products in turbo mode. The new dual band a/b products protects customer investment in wireless infrastructure and is compatible with both standards.

802.11b Products - 11Mbps

MA 311

11Mbps integrated PCI adaptor.

(F4339) **\$195**

MA 101

11Mbps USB adaptor.

(C7110) **\$215**

MA401

11Mbps PCMCIA card.

(C8117) **\$179**

MR314

DSL / cable wireless router with 4

switched ports.(C5223) **\$419**

HOT PRICE!

MA701

11Mbps type I / II compact flash card.

(E5891) **\$229**

ME102

11Mbps access point.

(B9929) **\$429**

FM114P

Cable/DSL ProSafe 11Mbps, firewall router, integrated 4 port 10/100Mbps switch and print server.

(F0904)

\$499

802.11a - 54Mbps Products & Dual Band 802.11a/b Products

HA 311

54Mbps integrated PCI adaptor.



(F4341) **\$399**

HA501

54Mbps Cardbus PC card.



(E5826) **\$429**

HR 314

54Mbps Cable/DSL wireless router.



Rent* \$11.75/wk
(F4342) **\$1,049**

WAB102

11/54Mbps dual band access point.



Rent* \$8.95/wk
(G4202) **\$799**

WAB501

11/54Mbps dual band PC card.



(G4203) **\$399**

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Networking Solutions

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Antennae
DWL-R60AT
(G2082) **\$56**
ANT24-0801
(F4220) **\$249**

For all your small to medium business and home network needs please call for more information and pricing. We have an extensive range of fantastic D-Link products on our database.

Filters
DSL-10MF
(E6973) **\$19**
DSL-10CF
(E6971) **\$32**
DSL-10SP
(E6970) **\$34**

Wireless Internet Access/Networking @22Mbps

DI-614+
AirPlus 22 Mbps Wireless DSL/Cable Router with 4 Port Switch



New 22Mbps
Wireless

(G0229) **\$487**

DWL-650+
AirPlus 22 Mbps Wireless LAN PCMCIA Card

SPECIAL PRICING



(F5422) **\$149**

DWL-520+
AirPlus 22 Mbps Wireless LAN PCI Adapter

SPECIAL PRICING



(F5421) **\$185**

DWL-900AP+
AirPlus 22 Mbps Wireless LAN Access Point



New 22Mbps
Wireless

SPECIAL PRICING

(F5423) **\$309**

Dualband Wireless Solutions 11/22/54 Mbps

DWL-6000AP

AirPro™ 11 / 22 / 54 Mbps (2.4GHz / 5GHz) Multimode Wireless LAN Access Point



Rent* \$9.96/wk (G3809) **\$995**

DWL-AB650

AirPro™ 11 / 54 Mbps (2.4 / 5GHz) ultimode Wireless LAN PCMCIA Card



(G3813) **\$385**

DWL-AB520

AirPro™ 11 / 54 Mbps (2.4 / 5GHz) Multimode Wireless LAN PCI Adapter



(G3814) **\$389**

Hi-Speed Internet Access

DSL-500 ADSL Router with Built-in Modem



(D0801) **\$379**

DSL-504 ADSL Router with Built-in Modem & 4 Port 10/100 Mbps Switch



(C7593)

\$429

Best Selling

DSL-300 Ethernet ADSL Modem



(B7198) **\$319**

DSL-200 USB ADSL Modem, Plug and Play USB Interface with the Host PC Through a USB Port

(B7197) **\$199**

DI-704P IP Router for DSL/Cable Modems with 4 Port Switch & Single Port Print Server



(E5861) **\$235**

Built-in Bigpond Cable Login

DI-707P IP Router for DSL/Cable Modems with 7 Port Switch & Single Port Print Server

(E7329) **\$309**

DFL-500
Secure Firewall & VPN -20 VPN Tunnels, DMZ, SPI, IPSec Security DES & 3 DES, Content Filtering & Virus Scanning, VPN Protocol, PPTP & L2TP

Firewall



Rent* \$11.93/wk (F0900) **\$1,065**

DI-804V
VPN Router for Cable/DSL. 8 VPN tunnels, DMZ, SPI, VPN Protocol PPTP & L2TP and IPSec Security



(F4303) **\$359**

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Networking Solutions

Switch Solutions For Every Application

Extensive Choices

D-Link offers an extensive range of switches for fast ethernet and gigabit ethernet. Unmanaged and managed solutions are available, with a variety of sizes for homes, small offices, workgroups, departments and enterprises. Port densities range from as few as 5 to as many as 128 ports per switch. Layer 2 switches without router capability and layer 3 switches with router capabilities are all available.

10/100 SOHO Solutions

DES-1005D 5 Port 10/100 Mbps Fast Ethernet Unmanaged Switch

(85101) **\$96**

DES-1008D 8 Port 10/100 Mbps Fast Ethernet Unmanaged Switch

(98254) **\$138**



10/100 Desktop Solutions

FREE 16MB USB Memory Stick

DES-1016D 16 Port 10/100 Mbps Fast Ethernet Unmanaged Switch

(F0915) **\$315**

DES-1024D 24 Port 10/100 Mbps Fast Ethernet Unmanaged Switch

(G1783) **\$417**



10/100 Rackmount Solutions

FREE 16MB USB Memory Stick

DES-1024R+ 24 Port 10/100 Mbps Unmanaged Switch with Optional Fibre Module (DES-102F)

Rent* \$7.47/wk (E3669) **\$667**

DES-1226R 24 Port 10/100 Mbps Unmanaged Switch with Optional Fibre/Gigabit Module (see modules**)

(G3817) **\$Call**



1000 Mbps Gigabit Solutions

FREE 16MB USB Memory Stick

DGS-1004T 4 Port Gigabit Copper Ethernet Switch

Rent* \$6.93/wk (G3818) **\$619**

DGS-1016T 16 Port Gigabit Copper Ethernet Switch

Rent* \$25.75/wk (G3825) **\$2,595**

DGS-1008T 8 Port Gigabit Copper Ethernet Switch

Rent* \$11.75/wk (D9338) **\$1,049**

DGS-1024T 24 Port Gigabit Copper Ethernet Switch with Optional 2 Port Mini GBIC

Rent* \$36.07/wk (G1968) **\$3,635**



Managed/Stackable Solutions

FREE 16MB USB Memory Stick

DES-3226S 24 Port 10/100 Mbps Managed Switch, Stackable (see modules**)

Rent* \$16.63/wk (F9634) **\$1,484**

DES-3236S 24 Port 10/100 Mbps Managed Layer 3 Switch, Stackable (see modules**)

Rent* \$35.68/wk (G3828) **\$3,595**



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Promo duration 01/12/02 until 31/12/02 for switches 16 ports or more only. Free 16MB memory comes bundled with purchased product.

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Switch Modules
DGS-332GS (F9636)

\$159

**DES-131F (G3829)

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**DES-132F (G3830)

\$385

**DES-132T (G3831)

\$543

**DES-132G (G3832)

Rent* \$10.25/wk **\$915**

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Belkin PDA

F8E717

LCD Screen Overlays - Compaq IPAQ (E0216) **\$24**

F8Q1002

Travel Kit for IPAQ H3100, H3600, H3700 Series (F9651) **\$59**

F8Q1000

USB Sync Charger (D5952) **\$42** for IPAQ H3700 Series & below.

F8Q1401

Leather Flip Case - IPAQ (E1520) **\$45**

F8Q1402

Slim Leather Case - IPAQ (E1521) **\$42**

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CONNECT MULTIPLE COMPUTERS USING BELKIN KVM SWITCHES

F1DB102P	Economy 2 Port KVM Switch - PS/ 2	(D3162)	\$92
F1DB104P	Economy 4 Port KVM Switch - PS/ 2	(D3159)	\$175
F1DS102P	SOHO 2 Port KVM Switch - PS/ 2	(D3163)	\$289
F1DS104P	SOHO 4 Port KVM Switch - PS/ 2	(D3166)	\$369
F1DS102T	SOHO 2 Port KVM Switch - PS/ 2 & USB	(D3165)	\$345
F1DS104T	SOHO 4 Port KVM Switch - P/S 2 & USB	(D3167)	\$437



OMNIVIEW PRO2 SERIES 4, 8 OR 16 PORT KVM SWITCH WITH ON SCREEN DISPLAY

F1DA104Tz	Pro 2 4-Port KVM Switch - PS/ 2 & USB	(E5376)	\$629
F1DA108Tz	Pro 2 8-Port KVM Switch - PS/ 2 & USB	Rent*\$8.22/wk (E5377)	\$829
F1DA116Tz	Pro 2 16-Port KVM Switch - PS/ 2 & USB	Rent*\$11.42/wk (E5378)	\$1,145
F1DM216Tz	Matrix 2x16 Port KVM Switch - PS/ 2 & USB	Rent*\$15.22/wk (E5380)	\$1,898

Don't forget to include your Belkin All-In-One cables

The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.



Belkin Surge Protectors

Belkin offers a complete Surge Protection range, for the average home to a total office solution. All Belkin Surge Protectors are guaranteed to protect against over-voltages, catastrophic surges and lightning strikes. We also offer the best no hassles connected equipment warranty in the business. We will repair or replace any damaged connected equipment.



F5C208z2-TEL3



F5C206z2-TEL3



B5CAU007

Belkin's Maximum Grade Surge Protectors

Connected Equipment Warranty up to \$80,000
Belkin's Maximum Grade Surge Protectors are the ideal solution for protecting high-end computers, servers, multi-media set-ups, critical office equipment including high volume copiers and faxes. They are also perfect for protecting your home theatre and other sensitive electronic equipment. (C4607) **\$119**

Superior Grade Surge Protectors

Connected Equipment Warranty up to \$50,000
Belkin's Superior Grade Surge Protectors, are the ideal solution for protecting mid level computers/office workstations, small office copiers and faxes. They are also perfect for protecting your TV, video/DVD & stereo and other electronic equipment. (C4604) **\$98**

Belkin's Home Office Grade

Connected Equipment Warranty up to \$25,000
Belkin's Home Office Grade Surge Protectors are the ideal solution for protecting entry level computers, cordless phone, bubble jet printers, personal copiers and all other home office electronic equipment.

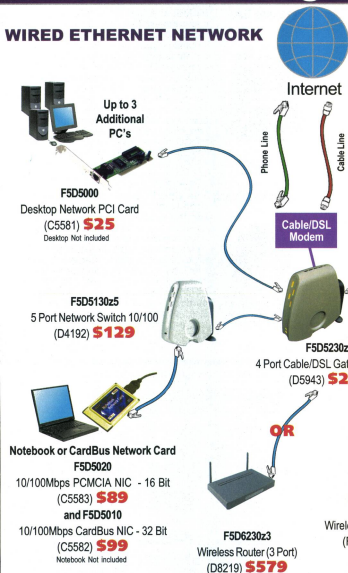
Purchase the Belkin B5CAU007 and receive a free single outlet surge cube F5C195z worth \$25



(F4128) **\$49**

Belkin Networking Solutions

WIRED ETHERNET NETWORK



WIRELESS NETWORK



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BELKIN
F8Q1503


SnapNTYPE keyboard
for
iPAQ 3800
(F3219)
\$89

F8Q2300


Stylus Pen
for
iPAQ 3800
(F9847)
\$15

F8E708


Stylus Pen
Belkin 4-in-1
Stylus Pen.
(C4694)
\$35

USB 2.0 Products - 40 X Faster than USB 1.1 USB 2.0 Upgrade Kit

F5U217AU
HIGH SPEED USB 2.0
3 PORT POCKET HUB.
(G1692) **\$94**

F5U220
HIGH SPEED USB 2.0 5
PORT PCI CARD.
(C7546) **\$96**

F5U900au
• Instantly upgrade your computer to the ultrafast speed of USB 2.0.
• Includes Belkin cable.
• Transfer Up to 480Mbps.
• USB 2.0 is ideal for transferring extremely large amounts of data such as real-time video cameras, scanners, portable drives and others.
• Compatible USB 1.1 spec devices.
F5U900au Upgrade Kit (F0897) \$139

F5U222au
PCMCIA (F0898) \$139

F5U148
Belkin USB
8-in-1 Media
Reader/Writer
(F9649)
\$99

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Camera Bag



DCCM15

This medium camera case from our **Classic Camera Line** keeps your camera organised and ready to travel.

Features a top loading camera compartment for easy access, adjustable shoulder strap, a front-zippered accessory pocket and more.

(G4129) **\$19**

Notebook Bag



RGS012

Includes: A padded notebook compartment that fits 15" screens, 2 side accessory pockets, nylon webbing zipper pulls, internal cushioned mobile phone pocket, oversized file compartment and slip pocket, accessory webbing loops on shoulder straps, contoured shoulder straps with 3-D air mesh, inner-pocket organisers and flat compartments, double-buckle wrap design for attaching extra gear, cushioned pocket for CD player with headphone port, key clip. Other colours available.

(F3511) **\$79**

Video Camera Case



DCRV01

Classic II Video Camera Case guards your small to medium video camera from damaging bumps and drops.

Features include a new, fashionable and lightweight design with an adjustable compartment divider for custom fit, padding for protection, full-length front zipper pocket as well as exterior back and side pockets for all your accessories.

(F7131) **\$25**

Sports Backpack



Olive C2100

The **Sports Backpack** combines ergonomic design with functionality for the mobile road warrior. Safely protecting your notebook with a padded compartment and an additional removable air cushion for extra protection, the Sports Backpack also provides multiple compartments for your files and accessories including CD & MP3 players, disks, cables and PC cards. Stylish & lightweight, it's many features include a mobile phone pouch and ergonomic padded shoulder straps.

(C9860) **\$119**

DCVL15

(G4127) **\$34**

DCRC01

(F7120) **\$12**

DCUC01

(F7130) **\$15**

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Microsoft Applications

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Small Business Server 2000

Microsoft Small Business Server 2000 is the 3rd generation release of the full featured network solution designed to help businesses with up to 50 PCs.

5 Cal (B8289) **\$655**

Full Version (B7734) **\$3,019**



Exchange Server 2000

- Microsoft Active Directory integration
- Multiple message databases
- Active Directory Connector

- Native Internet mail content
- Distributed Services (B2004)
- SMTP Routing

\$2,738



SQL Server 2000 Standard

- Scalable from laptop to multiprocessor cluster
- New query processor support for large databases and complex queries
- Dynamic row level blocking

5 Cal (B1205) **\$2,985**



Visual Studio .net Professional Upgrade

Build the next generation Internet. Developers can employ XML and built-in Microsoft ADO.NET tools to build high-performance, data-driven applications that target a variety of platforms.

Upgrade (E1951) **\$1,115**

Full (E1944) **\$2,263**



Microsoft Project 2002 Standard

Microsoft Project provides a complete project management solution, be more productive immediately and better manage projects.

Standard (E8525) **\$1,259**

Professional (F1300) **\$2,099**



Microsoft Visio 2002 Standard

Visio 2002 Standard edition can help turn ideas and information into understanding and action with task specific diagrams.

Standard (C3153) **\$433**

Professional (C3151) **\$1,069**

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Hot New Accessories from Targus

Wireless Optical Mini Mouse



**Free
Charger**

Conditions: - Valid for purchases of the Targus Wireless Optical Mouse (PAUM005U) between 1 November 2002 to 31 January 2003 - One redemption per customer - Not valid unless original proof of purchase attached - While stocks last - Redemption coupon must be received by 28/02/03. See www.targus.com.au for redemption details.

Smaller and lighter than most mice, the **Wireless Optical Mini Mouse** provides you with wireless navigation up to one metre from a **notebook or desktop computer**. Featuring instant plug & play, 27MHz operating frequency, a small USB receiver key and an optical sensor, the mouse can be used on virtually any surface. Also featured is an LED on the scroller wheel which lights when the batteries are low. Microsoft Windows 98, Me, 2000 and XP compatible. Exterior dimensions: 9.8 x 5.9 x 3.8cm.

PAUM005U (F3343) **\$95**

Ultra Mini 4-Port USB Hub

This ultra light-weight, compact 4 port USB hub is suitable for PC notebooks or USB-enabled desktop computers.



Over current protection on each port prevents power shutdown of the hub. Supports both full-speed and low-speed transfer rates and has a 1m cable.

PA055U (F0749) **\$37**

USB-PS/2 Optical Mini Mouse V.2



One of the world's smallest optical **screen scroller** mice. Can be used on any surface except glass. No tracking ball, so it never needs cleaning! Using the "Screen-Scroller" wheel you can move any direction and alternate between applications. It comes with a USB to PS/2 adapter for compatibility with Microsoft Windows 95, 98, 2000 and NT. On the plane or in the office this is the perfect mouse.

PAUM003U V2 (G4155) **\$59**

Podium CoolPad

Keep your notebook cool with the **NEW Targus Podium CoolPad**. The CoolPad improves the cooling efficiency of your notebook by raising the back edge and increasing the airflow around the computer. This can be extremely helpful for notebooks that run hot or are over worked. The six small rubber pads on the bottom of the CoolPad provide a tight grip, making it a great tool for air travellers. It protects furniture from damage due to heat or abrasion as well as protecting your notebook from spilled liquids.



Notebook not included

PA241U (G4156) **\$64**

Universal Auto/Air Adapter



A dual purpose power source, the new-look, ultra-slim universal Auto/Air allows you to plug virtually any notebook into airline seats with Empower™ capability or in vehicles with standard cigarette lighters. Power or re-charge your notebook on the road and in the air.

PA360U - most IBM, Toshiba & Compaq notebooks

PA360U (F0747) **\$216**

PA380U - most HP, Sony, Fujitsu & Panasonic notebooks.

PA380U (F0748) **\$216**

USB Legacy Cables

USB to Serial Adapter

As notebook computers continue to be miniaturised and more devices use USB or Firewire there is less demand for legacy ports to be fitted to computers. The Targus USB to serial port adapter cable allows the use of legacy devices through your computer's USB port.

USB to Parallel Adapter

The Targus USB to Parallel adapter is the easiest way to connect an Inkjet, Laser or Dot Matrix printer that requires a "Parallel" port to a non legacy system. The Targus USB Legacy Range offers simple and tidy connectivity solutions.



Keypad/Integrated Calculator



The **Targus Mobile Mini Keypad** is a 17 key numeric pad with 12 additional calculator function keys. Lightweight and compact, it is fully compatible with Microsoft Windows 98, 2000, Me, XP and greater. Neatly stores a 91cm USB cable. Send your calculation results to the active application without re-keying.

PAUK001 V.3 (F2985) **\$95**

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PDA Combo Kits



CHKIT1 - iPAQ

(F0735) **\$27**

CHKIT2 - Jornada/Tosh

(F0736) **\$27**

CHKIT3 - Palm M500/505.

(F0737) **\$27**

PDA In - Vehicle Charger

(F0738) **\$19**

CHVC01 - iPAQ 38xx

(F0738) **\$19**

CHVC03 - Palm

(F0739) **\$19**

CHVC02 - Jornada

(F0743) **\$19**

CHVC04 - iPAQ 36xx

Tosh e570.

(F0745) **\$19**

PDA USB Charge Sync Cables

PA265U - Palm M500

(E4164) **\$35**

PA285U - Jornada

(F2922) **\$35**

PA290U - iPAQ 3600

(E0378) **\$35**

PA295U - iPAQ 3800

(F8333) **\$33**



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Peripherals and Accessories

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Pocket PC Accessories

CompactFlash Modem


 (83607) **\$235**

CompactFlash WLAN Card


 (G3838) **\$257**

CompactFlash GPS Card


 (E5015) **\$475**

Compact Camera


NEW

(F0865)

\$249

Compact Bluetooth


NEW

(F0866)

\$259
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Digital Memory Readers



CompactFlash

(F0861)

\$38

MemoryStick

(F0864)

\$38

Secure Digital/MultiMediaCard

(F0863)

\$38

SmartMedia

(F0862)

\$38

USB Connectivity, Portable
Compact Design, Hot swappable.

Multi Card Reader

USB 1.1 (F5533)

\$77

USB 2.0 (G3844)

\$98


Digital Memory Cards

CompactFlash

32MB CompactFlash (B2921)

\$49

64MB CompactFlash (B2922)

\$78

128MB CompactFlash (B2923)

\$135

256MB CompactFlash (C0777)

\$253

512MB CompactFlash (E1225)

\$517

SmartMedia

16MB SmartMedia (B2915)

\$26

32MB SmartMedia (B2916)

\$39

64MB SmartMedia (B2917)

\$69

128MB SmartMedia (C3680)

\$139

SecureDigital Cards

16MB SecureDigital (D4115)

\$49

32MB SecureDigital (D4116)

\$84

64MB SecureDigital (D4117)

\$123

128MB SecureDigital (D5918)

\$249

MultiMedia Cards

32MB MultiMediaCard (B9873)

\$49

64MB MultiMediaCard (B9878)

\$106

128MB MultiMediaCard (F7833)

\$229

Expansion Cards

FIREWIRE



Cardbus FireWire Card

(B9849)

\$88

USB 2.0



USB 2.0 Cardbus Card

(E6328)

\$88

For Desktops



PCI FireWire Card

(90689)

\$49


PCI FireWire USB 2.0 Combo Card

(E5013)

\$153


PCI USB 2.0 Card

(F2992)

\$49

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IDE Ultra DMA

133 Raid Card

(E7377)

\$85


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\$69


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Parallel Cards,
USB Hubs and
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Verbatim

RENTSMART
*The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Prices are subject to change. Check here for latest prices & products!!

Web Direct
www.ht.com.au/cat/verbatim

CD/DVD Duplicators and Publishers

Verbatim

CopySmart CD and DVD Copiers

No PC required
Single button copy
All drives burn simultaneously



Drives	40x CD-R	Drives	2x DVD-R
1	Rent* \$13.77/wk (F3430) \$1,229	3	Rent* \$41.58/wk (F7628) \$4,395
3	Rent* \$21.73/wk (F1867) \$1,939	5	Rent* \$60.88/wk (F7629) \$6,597
7	Rent* \$36.66/wk (F1349) \$3,875	7	Rent* \$78.26/wk (F7630) \$8,793

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
*Delivery charges extra.

PRIMERA TECHNOLOGY, INC.

Bravo Burn and Print

Introducing the World's First Fully Integrated CD-R Burning and Printing Device.

- 2400 dpi Printing
- 40x CD-R drive
- Windows 2000/XP Software
- Fully integrated robotics
- 25 disc capacity for unattended burning and printing

NEW

 Rent* \$41.11/wk (G1708) **40x CD-R \$4,346**

 Rent* \$50.14/wk (G1709) **2x DVD-R \$5,434**

Desktop Publishers

Choose 1, 2 or 4 40x CD-R
or 2x/8x DVD-R drives

R I M A G E™


Desktop 800 CD-R 40x, 60 Disc

- Network burning software included with unlimited user site license
- Integrated inkjet printer
- 50 - 110 disc capacity
- Fully automated disc production
- Comes with software, firewire card and cables

 Single Drive Rent* \$76.38/wk (F7882) **\$9,109**


4 Drives pictured

PRIMERA TECHNOLOGY, INC.

Signature Pro CD Printer



- 2400 dpi
- Superfast
- Dual Ink cartridges

Rent* \$37.60/wk (C3681)

\$3,789

Inscripta Printer



- 610 x 305 dpi thermal
- Durable finish

Rent* \$46.25/wk (B2932)

\$4,889
R I M A G E™

Prism Plus! Printer



- 300 x 600 dpi
- Mono or 3 colour
- 2,100 mono prints per ribbon
- Less than 10 secs per mono print.

Rent* \$64.87/wk (G3859)

\$7,288

See page 30 for Printable Discs for these printers

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PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999
Web: www.ht.com.au
Fax: 1300 13 6666
Email: sales@ht.com.au

HARRIS TECHNOLOGY Technology Centre
at Kmart Broadway-Sydney

CD and DVD Media: Storage for Life

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
Delivery charges apply.

Verbatim DVD Media

DVD-R



4.7GB DVD-R for general data - singles

(C8840) **\$9**

Printable surface discs also available

DVD-RW



4.7GB DVD-RW (version 1.1) - singles

(C8841) **\$12**



4.7GB DVD+R - singles in video box

(F9427) **\$11**

Jewel case also available

DVD+RW



4.7GB DVD+RW - singles

(D9166) **\$12**

DataLifePlus CD-R - 48x



NEW

80min.
700MB 1x - 48x
10 Pack

(G1680) **\$11**

MusicLifePlus CD-R Audio



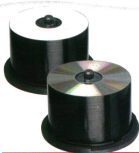
80min.
10 Pack

(C7889) **\$13**

80min.
Singles

(D0011) **\$2**

Printable CD-R Media



In spindles of 50
inkjet printable
80min 48x.

(G1742) **\$42**

Silver thermal printable
80min 16x.

(D0562) **\$42**

See page 29 for CD Printers.

DataLife CD-R

NEW

- Third generation Phthalocyanine Recording Dye Technology.
- Scratch resistant surface.

80min. DataLife SlimCase
10 pack 48x

(F8563) **\$9**

80min. DataLife spindle
25 pack 48x

(F9171) **\$18**



Digital Vinyl CD-R



Designed to look like a vinyl record these eye-catching discs are a great way to save delicate LP collections or make a standout business presentation.

80min Vinyl
CD-R 10 pack

(G1731) **\$12**

Pocket Colours 8cm CD-R



Mini CD's that fit in your pocket!

Store up to 3 hours of MP3's or up to 185MB of pictures, files or any data you like. Compatible with any standard tray based CD player or burner.

21Min, 185MB
1x -16x 5 Pack

(D9192) **\$8**

21Min, 185MB
1x-16x 10 Pack

(C9459) **\$15**

DataLifePlus Colours CD-R



80 Min. 700MB
coloured CD-R's
in a 25 pack 48x

(G2890) **\$28**

80 Min. 700MB
coloured CD-R's
in a 10 pack 48x

(G2015) **\$11**

DataLifePlus CD-RW

700MB CD Rewritable
2x - 4x 5 pack colours

(D9230) **\$8**

650MB 2x - 4x
singles

(77492) **\$2**

700MB 16x -24x singles

(G1741) **\$2**

650MB 4x -12x singles

(F3941) **\$2**



Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Super-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

Did you know...



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HARRIS TECHNOLOGY

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LACIE

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/lacie

Best Storage Solutions

d2 External Hard Disks

The LaCie d2 external hard disk range is flexible system with casing made of extruded aluminium, like that of Formula 1 cars, which provides greater robustness and heat dispersal in a light weight package.

- Kensington cable lock and power lock for better security.
- Front power button and blue activity LED, switches on/off with your computer.
- Supplied with drivers for PC.
- Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately).

Stackable	80GB	7200rpm	FireWire	(G1744)	\$485
	120GB	7200rpm	FireWire	Rent* \$7.03/wk (F7923)	\$628
	200GB	7200rpm	FireWire	Rent* \$11.17/wk (G3138)	\$997
	80GB	7200rpm	USB 2.0	(G1817)	\$485
Rack mountable	120GB	7200rpm	USB 2.0	Rent* \$7.03/wk (G1281)	\$628



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
Delivery charges extra.

LaCie
Floppy
USB
(F8125)

\$109

Limited offer until end of year 2002

Get a USB 2.0 card or FireWire card

for \$49 extra with purchase of any LaCie drives

LaCie USB 2.0 PCI card 4 ports (G4188) **\$49**

LaCie FireWire PCI card 4 ports (G4190) **\$49**

d2 External CD-RW/DVD-R/RW d2 External AIT Tapes

The LaCie CD-R/DVD-R/RW come complete with all the necessary software and cables to begin burning DVDs on your PC. They are the best professional burners on the market being silent, efficient and affordable.



DVD-R/RW/CD-R/RW (A05)
USB 2.0 & FireWire

Rent* \$10.41/wk (G0456) **\$929**

CD-RW 48/24/48 USB 2.0 (G4178) **\$350**

CD-RW 48/24/48 Firewire (G4217) **\$377**

The LaCie d2 tape drives include cables, 1 cartridge and Retrospect desktop v5 software.



AIT-1 (35GB) USB2.0 & FireWire

Rent* \$22.51/wk (G1075) **\$2,009**

AIT-2 (50GB) Ultra2LVD

Rent* \$33.94/wk (G1904) **\$3,319**

AIT-3 (100GB) Ultra160

Rent* \$75.21/wk (G1906) **\$8,450**

Pocket CD-Recorders

The LaCie Fusion CD-RW is made of sleek aluminium. Includes EZ CD Creator for PC.



CD-RW Fusion
24/12/40 USB 2.0

(F7291) **\$299**

Pocket Hard Disks

The LaCie Pocket hard disks are the most robust and mobile drives on the market. Made of light aluminium for better cooling and fully included in a silicon bumper for better protection of the drive. Includes USB 2.0 and bus powered Firewire interface, complementary power supply and drivers.

20GB USB 2.0 & FireWire

(F5369) **\$489**

40GB USB 2.0 & FireWire

Rent* \$7.03/wk

(F5371) **\$628**

60GB USB 2.0 & FireWire

Rent* \$9.96

(G4421) **\$879**



CD-RW 24/10/24
USB 2.0 & FireWire Rent* \$6.43/wk (G1908) **\$574**



Ask
About...



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Sales: 1300 13 9999

Fax: 1300 13 6666

Web: www.ht.com.au

Email: sales@ht.com.au

HARRIS Technology Centre
at Kmart Broadway-Sydney

Not all products are in-store, but consulting & advice available on all items

New external hard drives

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.

*Delivery charges apply.

Wine
on-line?



vintagecellars.com.au



Fast
Delivery
Australia-
Wide

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

Your Best Ideas Need Maxtor OneTouch



Easy - Just push the button to make a backup copy of your files.

Fast - Back up files faster than floppy, CD or removable cartridge systems.

Convenient - Make backup copies of your files, while you work, with a simple push of a button.

Flexible - Use Maxtor OneTouch or run automated, unattended backups with Dantz® Retrospect® Express.

Quick and Easy Installation

- 1 Install the software
- 2 Plug in the drive
- 3 Push the button and follow the on-screen directions

PERSONAL STORAGE

5000LE



Perfect for home or office
Exclusive Maxtor OneTouch **80GB**

80GB (G4110) **\$449**

Ideal for home or office, the Maxtor Personal Storage™ 5000LE external hard drive quickly adds storage and organizational space through your computer's USB port.

- Easy add-on storage for home or office
- Perfect for photos, music, and documents
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included

- USB 2.0 & USB 1.1 compatible
- Up to 480Mb/sec data transfer rate
- Quick and easy installation
- Maxtor award-winning hard drive technology
- Stands vertically or horizontally

PERSONAL STORAGE

5000DV

Perfect for video editing and high-end graphics

Exclusive Maxtor OneTouch **120GB**



120GB Rent* \$7.83/wk (G4112) **\$699**

The Maxtor 7200 RPM hard drive plus both FireWire (IEEE 1394, i.LINK®) and USB 2.0 interface ports gives you one of the most versatile drives available for your PC.

- Versatile add-on storage for editing
- Videos and high-end graphic files
- Maxtor OneTouch™: the easy way to make backup copies of your files

- Dantz® Retrospect® Express software
- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Powerful performance—7200RPM
- Expandable storage

PERSONAL STORAGE

5000XT

Perfect for storage - hungry files

Exclusive Maxtor OneTouch **250GB**



250GB Rent* \$10.07/wk (G4113) **\$899**

Flexible add-on storage for your home or office, with room to grow. With 250GB, the Maxtor external hard drive provides you enough capacity to hold and organize your storage-hungry applications and files.

- Flexible add-on storage for storage-hungry files
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included

- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Expandable storage
- Stands vertically or horizontally
- Hot-swappable

DEC

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HARRIS TECHNOLOGY™

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Smart Storage Solutions

Zip 750MB Drive

More speed, and more capacity, this NEW 750MB drive and disk is the fastest and most durable, portable storage solution to back up your important data. Iomega Automatic Backup software makes backup a snap and Iomega Sync software helps transfer files between computers. Zip 750MB drives and disks are the smart data storage choice.



**\$50 CASH BACK +
FREE 750MB DISK!**

Valid until Dec 31st 2002 with purchase of any Zip 750MB drive. Via redemption: send proof of purchase and the sticker from the box to stickers - further details on box stickers.

USB (F9601) **\$418**

Firewire (G2978) **\$429**

External Hard Disk Drive

Iomega External Hard Drive adds secure storage easily and quickly.

It comes complete with Iomega Sync™ and Automatic Backup™ disaster recovery software to protect your files.



80GB Rent* \$7.68/wk (F9625) **\$686**

120GB Rent* \$9.48/wk (F9789) **\$846**

NEW!

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

Zip 100 USB Powered

An affordable total storage solution as easy to use, but far superior to the floppy drive. Iomega's Zip® 100MB USB-Powered drive is affordable, reliable, easy to use and has a sleek, durable design powered through the USB cable for complete plug-and-play compatibility.



(D0587) **\$165**

Portable Hard Disk Drive

Iomega portable HDD drive is a complete solution that makes security, recovery and data storage easy. QuickSync™ automatic back-up and disaster recovery software protects your files. Built in a durable, slim design that's easy to take with you.



USB2 Card sold separately

20GB (G4021) **\$469**

40GB Rent* \$7.45/wk (F9794) **\$665**

iomega

NEW!

Zip 750MB
2 pack disk
(F9779) **\$59**

Zip 750MB
10 pack disk
(F9780) **\$298**

NAS Servers

Choose Iomega for easy-to-install and manage network storage solutions that allow multi-platform file sharing and data consolidation. Hot-swappable drives and RAID 5 data protection, Iomega NAS servers deliver enterprise class data access and reliability for small business budgets. Plus, you choose the capacity, OS, level of performance and data reliability - so you get the optimum data storage and backup solution.



160GB Unix-based Rent* \$48.38/wk (F9749) **\$5,243**

320GB Unix-based Rent* \$66.38/wk (F9751) **\$7,458**

480GB Unix-based Rent* \$76.59/wk (F9829) **\$9,135**

160GB Microsoft-based Rent* \$60.52/wk (F9756) **\$6,799**

320GB Microsoft-based Rent* \$75.11/wk (F9769) **\$8,958**

480GB Microsoft-based Rent* \$92.05/wk (F9830) **\$10,978**

Zip 100MB
disk
(23772) **\$19**

10-pack:
(21889) **\$189**

Zip drive
carry case
(31823) **\$49**

Zip disk
250MB
(74454) **\$29**

Zip disk
250MB 10
Pack
(74452) **\$249**

CD-RW 48x24x48x USB 2.0

For the fastest and easiest way to save and share music, photos and more, choose an Iomega® CD-RW drive. With up to 48x24x48x write/rewrite/read speeds you can burn a 60-minute CD in less than 3 minutes. Includes plug-and-play functionality for portability, buffer under-run protection for reliability and Iomega HotBurn® Pro software with advanced functionality for easy CD customization, burning MP3s and organizing digital photos.



(G4143) **\$433**

Host Powered 250 USB

NEW - Host-powered Zip® 250MB USB drive. Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. Its easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip® 100MB and 250MB Zip® disks.



(B6404) **\$319**



Multimedia: DVD & Blank Media

Now even faster! 4x DVD-R 2x DVD-RW

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

Pioneer DVD-R MEDIA



DVS-R47BF
4x DVD-R
General media with slim jewel case
(G2072) **\$10**



DVS-RP47BF
4x DVD-R
Thermal / Inkjet printable with slim jewel case
(G2073) **\$12**



DVS-R47BP5F
4x DVD-R
5 Pack with slim jewel case
(G2074) **\$45**

Pioneer DVD-RW MEDIA



DVS-RW47CF
2x DVD-RW
with slim jewel case
(G2075) **\$15**

DVR-A05



DVD-R / RW Writer
CD-R / RW Writer

FEATURES:

Writes:

- DVD-R 4x
- DVD-RW 2x
- CD-R 16x
- CD-RW 8x

NEW

Faster writing:

Writing a full 4.7GB DVD-R disc can now take just 15 minutes instead of what was once an hour-long process

DVR-A05 \$699

Rent* \$7.83/wk (G2070)



INCLUDES COMPREHENSIVE SOFTWARE PACKAGE

- DVD Workshop SE
- VideoStudio 6.0 SE DVD
- DVD PictureShow SE
- Veritas RecordNow DX
- DLA & Simple Backup
- PowerDVD XP

- DVD Authoring Package
- Video Editing Suite
- Burn your still images onto DVD
- High performance CD or DVD recording
- Write data files to CD or DVD
- For DVD movie playback

- DVD Authoring example CD
- 1 x DVD-R media
- 1 x DVD-RW media



DVR-105EXT

DVD-R/RW/CD-R/RW drive in firewire (IEEE1394) / USB 2.0 external case.

SOFTWARE INCLUDED:

Same as DVR-A05

Rent* \$11.19 (G3800) **\$999**



DVD-A06SZ 16x

SLOT LOADING DVD-ROM DRIVE RETAIL KIT

FEATURES:

- 16x slot loading DVD-ROM drive (40x for CD)
- Ultra DMA66
- Vertical or horizontal mounting
- 2 year warranty

SOFTWARE INCLUDED:

- PowerDVD XP

BONUS:

- 5 x DVD movie rental vouchers

(E5965) **\$132**



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HARRIS TECHNOLOGY™



PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Microsoft hardware

NEW

Optical Mouse Blue The Mouse that Brightens your Desktop

Turn any desktop into a bright, vibrant, space. Microsoft Optical Mouse Blue includes a wider, clear scroll wheel, with a signature red optical glow, all in a fun design. Roll and scroll in style!

Benefits:

- Unique Clear Scroll Wheel
- Fun Optical Glow – No mouse ball!
- Comfort for Either Hand
- Dazzling Design



(F9311) **\$55**

Multimedia Keyboard

The Multimedia Keyboard That Fits Your Digital Lifestyle

Now there's a keyboard that maximizes your digital experience! One-touch buttons take you directly to your favorite multimedia activities—navigate music and video clips, surf the Web, start the programs you use most, and more. With easy-to-use keys and custom blue accents, the

Microsoft Multimedia Keyboard adds dynamic features and vibrant looks to any desktop



(F9313) **\$74**

Notebook Optical Mouse

Captures over 6000 frames per second

- The superior tracking speed translates into smooth, accurate cursor performance & works on most surfaces
- An eye-catching translucent look & wider design makes users scroll through files & have fun
- Features Microsoft's Optical Technology for smooth & accurate performance
- Scaled down in size & contoured for users comfort
- Connects to a rectangular Universal Serial Bus port for plug-n-play convenience



(G3159) **\$67**

Natural Multimedia Keyboard

The Natural Keyboard Pro gives you one-touch access to the Internet

Your e-mail, and your favorite multimedia controls. With its powerful IntelliType™ Pro software and built-in USB ports, the Natural Keyboard Pro combines comfort and



control to let you work more efficiently. The Natural Keyboard Pro works the way you want it to—thumb buttons act as forward and back buttons in a browser

(G3157) **\$109**

NEW

Wireless Optical Mouse Blue Brighten Your Desktop with Wireless Freedom

Turn your desktop into a vibrant, clutter-free space with Microsoft Wireless Optical Mouse Blue. Wireless technology, a wider, clear scroll wheel, and signature red optical glow combine in a fun design. Roll and scroll in style and freedom!

Benefits:

- No Cord, No Clutter
- Unique Clear Scroll Wheel
- Fun Optical Glow – No mouse ball!
- Comfort for Either Hand
- Dazzling Design



Special
Pricing
(F9312) **\$95**

Intellimouse Explorer

IntelliMouse Explorer uses a new optical sensor called IntelliEye



(D3801) **\$95**

IntelliMouse Explorer uses a new optical sensor called IntelliEye. It scans the surface beneath the mouse 6,000 times per second for accurate tracking. It works on hundreds of surfaces and stays precise because there are no moving parts to wear out or stick. All the sensor needs is a surface with a small amount of detail, including wood, plastic or even fabric. The two thumb buttons act as forward and back buttons in a browser. Feels great in a hand - This mouse is designed to support the hand and fingers

MS Internet Keyboard

Easy One-Touch Access to the Internet, E-mail, and more

The Microsoft® Internet Keyboard gives you one-touch access to e-mail, the Web, and the programs you use most. The familiar, durable keyboard design, customizable Hot Keys, and Control key Shortcut labels help you work more efficiently



(F9189) **\$49**

Benefits:

- Get fast and easy one-touch access to the Web, e-mail, and your favorite applications
- Customizable Hot Keys for quick access to your favorite programs and Web sites
- Durable, familiar keyboard design Detachable palm rest

Wireless Optical Desktop

Discover a complete wireless solution that frees your desktop from clutter

Get everything you've always wanted with a keyboard and mouse in one package - wireless freedom, stylish looks, and one-touch features. With customizable keys, optical mouse technology, and a cool design, it's the all-in-one desktop solution. Performance and



style look better than ever.

Keyboard Features: Hot Keys for quickly start Messenger, Mail, Internet, and Calculator programs. Enhanced F Keys Perform common tasks right from your keyboard.

Mouse Features: Optical Technology The optical sensor replaces your mouse ball, for accuracy and precision.

(G4210) **\$215**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY
Delivery charges extra.

HARRIS TECHNOLOGY
Technology Centre at

Officeworks

Chedstone - VIC

Technology Centre Shoppers
Not all products are in-store, but consulting & advice available on all items.



Fast
Delivery
Australia-Wide

Web
Direct

See
Web
Direct
Link

(at top of page)
for
more
products
and
latest
info!

DEC

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Surround Yourself . . .

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.

NEW

QuickCam Zoom
(G2802)
\$188

Cordless Optical Mouse

optical
(16996) **\$99**

MouseMan Dual Optical
(D4013)
\$79

Optical Mouse
(B9948)
\$45

Access Keyboard
(F7292)
\$38

QuickCam® for Notebooks Pro

NEW



This ultra-portable webcam features a high-quality VGA CCD sensor and includes an integrated mount and built-in microphone. Bring your instant messages to life by adding live video, e-mail photos and videos or make live video calls. 2-year warranty.

(G2810) **\$219**

QuickCam® Pro 4000

NEW

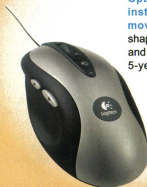


This premium webcam lets you express your creativity like a pro. Capture, edit and share high-quality videos, megapixel photos and add video to your instant messages. 2-year warranty.

(F8835) **\$227**

MX™ 500 Optical Mouse

NEW



Logitech's MX Optical Engine responds instantly to your fastest movements. Contoured shape for maximum comfort and complete control. 5-year warranty.

(G2797) **\$128**

MX™ 700 Cordless Optical Mouse

NEW



MX Optical Engine responds instantly to the fastest movement. Fast RF cordless technology delivers performance without a cord. Cruise Control enables continuous scrolling in long documents. Always ready to work with the included rapid charge station. 5-year warranty.

(G2474) **\$189**

Elite™ Keyboard

Provides expert controls that simplify everything you do. The ultra-flat design brings maximum efficiency with one-touch controls, enhanced commands and smart navigation. 5-year warranty.



(F4395) **\$88**

Cordless Elite Duo™

NEW

Cordless Elite Duo combines the ultimate ultra-flat cordless keyboard with the high-performance Cordless MouseMan Optical for maximum freedom, performance and style. 5-year warranty.



(G2807) **\$225**

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HARRIS TECHNOLOGY™

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...With The Very Best

Pocket Digital™

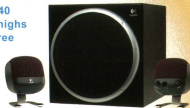


Pocket Digital is a credit card sized camera that lets you take pictures wherever you are. It comes in a sleek aluminium design that fits into your pocket. Capture up to 52 high resolution pictures at 1.3 megapixels, then download them to your PC with a single click. USB connection. 2-year warranty.

(F0257) **\$245**

Logitech® Z340

The Logitech Z340 produces clear highs and distortion-free lows through a revolutionary 3-piece system design, delivering twice the bass energy of similar systems. The satellites provide a convenient headphone jack and volume control. An internal power supply eliminates bulky wall adaptors. 2-year warranty.



(E1070) **\$95**

Logitech® Z640

Experience home-theatre sound on your PC with this 5.1 speaker system. Its revolutionary subwoofer delivers twice the bass of similar systems and five satellites provide silky-smooth mid and high frequencies. 51 watts RMS.



(G2806) **\$199**

Freedom 2.4 Cordless Joystick



NEW
Revolutionary cordless joystick using Logitech's 2.4 GHz Cordless Freedom technology to deliver reliable, lag-free performance. Includes aluminium trigger and throttle, twist handle, programmable buttons and hat switch.

(G2800) **\$167**

MOMO® Racing Force

Authentic MOMO racing wheel. The full rubber wheel, stick shifter, pedals and force-feedback technology for the best realistic racing experience. 2-year warranty.



(G2809) **\$248**

Logitech® Z680 THX®

NEW
THX-certified 450 Watts RMS 5.1 surround sound speaker system. Dolby Digital and DTS hardware decoding. Includes Digital SoundTouch Control Center and wireless remote. 2-year warranty.



(G2817) **\$795**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY.
*Delivery charges extra.



MX™ 300
Optical mouse



(G2793) **\$98**

QuickCam® for Notebooks



(F3093) **\$129**

QuickCam Express

(D5894) **\$99**



Cordless MouseMan Optical (C1186)

\$129



MouseMan Traveller (D4014)

\$109



CASIO®

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/casio

NEW 2 million pixel EXS2

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

DEC

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Casio EXS2 Exilim 2.0MP

The Movie Mode can be used to record movies, each of which can be up to 30 seconds long. Clear, realistic images let you capture all of the action of sports and other fast paced events.



model:	Casio EXS2 Exilim	Casio EXM2 Exilim
Image Size:	1600 x 1200, 1280 x 960 & 640 x 480	1600 x 1200, 1280 x 960 & 640 x 480
Recording:	Stills (JPEG), movie (AVI)	Stills (JPEG), movie (AVI)
Memory:	12MB internal	12MB internal
Pixels:	2.0 million pixels effective CCD	2.0 million pixels effective CCD
Monitor:	1.6" TFT Colour LCD	1.6" TFT Colour LCD
Communication:	USB connection/ cradle	USB connection/ cradle
Power:	Rechargeable lithium ion battery	Rechargeable lithium ion battery
Size:	W: 88mm x H: 55mm x D: 11.3mm	W: 88mm x H: 55mm x D: 12.4mm
Weight approx:	88g excluding battery	88g excluding battery
Rent*	\$7.76/wk	\$8.92/wk
part number	(G1941) \$693 Wearable Card Camera	(G1944) \$796 Wearable Card Camera, MP3 Player & Movies with audio

30-second movies at 320 x 240 (with audio), recording upto 50 minutes of voice dictation (Head phones and remote controller included!)

Casio QVR4

Casio QVR4 4 Mega Pixel Digital Camera



- Effective Pixels: 4.0 million Pixels
- Still Images: JPEG, DCF standard,
- Movies: AVI (Open DML Motion JPEG standard)
- 11MB Built-in Memory; SD Memory Card; Multimedia Card
- 3 X optical zoom, 3.2 X digital zoom, 9.6 X total zoom
- Flash Modes: AUTO*3, ON, OFF; Red eye reduction Approximate Flash Range: 0.4 to 2.8 m
- 1.6" TFT color LCD (84,960 pixels, 354 x 240)
- USB port (Mini-B); AC adaptor terminal (4.5 V DC)
- Supplied with: Rechargeable lithium ion battery

Rent* \$12.19/wk (G1947) **\$1,088**

Casio QVR3

Casio QVR3 3 Mega Pixel Digital Camera



Rent* \$11.11/wk (G1946) **\$992**

Casio Exilim Wearable Card Camera - 1.2 million Pixel		
	Casio EXS1 Wearable Card Camera	Casio EXM1 with MP3 Player. 30-second movies at 320 x 240 (with audio), recording upto 50 minutes of voice dictation
(F5213)	\$549	Rent* \$7.76/wk (F5214) \$693

New Release Casio QV5700



5.0 megapixel

- High-resolution 5.0-megapixel primary colour CCD
- Canon high-brightness F2.0 optical 3x zoom lens; total zoom of 9.6x in combination with 3.2x digital zoom
- The lens accepts various filters, Canon conversion lenses and macro lenses currently available on the market.
- Supports IBM Microdrive (both 1 GB and 340 MB)
- Multi-area auto focus (AF) ensures the entire area is in focus
- Focus-area shift allows selection from among nine focus areas.
- ISO settings up to 800 In addition to automatic ISO setting, sensitivities of ISO50, 100, 200, 400 and 800 can be manually selected.
- Image playback in 35 mm film aspect ratio (3:2)
- TIFF image (RGB) storage mode
- 1.8-inch high-definition TFT LCD
- External flash terminal

Rent* \$19.04/wk (G3939) **\$1,699**

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.									
								FINANCE METHODS ARE SUBJECT TO APPROVAL.	

Kodak

RENTSMART

*The figures quoted are based on a per week basis over 3 years. T.A.R. Terms & Conditions apply.

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Web Direct

www.ht.com.au/cat/kodak

Share Moments. Share Life™



Kodak LS420

Simple. Little. Fun.

Introducing a nifty little camera that fits anywhere, goes any place, and does just about anything.

Rent* \$7.49/wk (E7255)

\$669

- 2.1 Megapixel for beautiful prints.
- Kodak colour science technology.
- New night shot flash mode.
- On-camera print button
- Part of the EasyShare System.
- Movie mode with audio recording during capture.

Kodak DX4900

The first print-optimised Camera.

- 4.0 Megapixel pixel
- 6x zoom (2x optical 3x digital)
- 3 sharpness models
- Flash modes, auto, fill, red-eye, off
- ISO settings 100, 200, 400
- White balance modes Auto, Daylight, Tungsten, Fluorescent
- Shutter speed controls auto 1/2000 sec to 16 seconds.



Rent* \$10.07/wk (E3471)

\$899

Kodak DX3215

Making digital easy— one picture at a time.

- 1.3 Megapixel
- 4x zoom (2x optical and 2x digital)
- It's the perfect camera to get you into digital picture-taking
- One touch picture transfer
- 6MB internal memory.



(C9539)

\$389

Kodak DX4330

EasyShare zoom digital camera.

- 3.1 Megapixel
- 10x zoom (3x optical, 3.3x digital)
- 16MB internal memory
- New share button on camera.
- Kodak colour science technology
- Compatible with optional Kodak EasyShare camera dock.



Rent* \$8.90 (F9806)

\$794

Kodak LS443

Introducing the Kodak EasyShare LS443 zoom digital camera.

- 4.0 Megapixel
- 10x zoom (3x optical, 3.3x digital)
- Focus distance: 0.6m (2ft.) to infinity
- Integrated lens protection



Rent* \$13.39/wk (G1816)

\$1,195

Kodak CX4200

Get ready to shoot – and share.

- 2.0 Megapixel
- 2x digital zoom
- 16MB internal memory expandable with MMC/SD memory card slot
- Auto picture rotation on camera, PC or TV.



(F9631)

\$394

Kodak CX4230

EasyShare Zoom digital camera.

- 2.0 Megapixel
- 6x zoom (3x optical, 2x digital)
- New share button on camera
- Kodak colour science inside
- 16MB internal memory and MMC/SD card expansion
- Compatible with optional Kodak EasyShare camera dock.



Rent* \$6.49/wk (F9796)

\$579

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PICTURE CARDS

32MB Picture Card

(62677) **\$57**

64MB Picture Card

(82249) **\$89**

128MB Picture Card (A5253)

\$159

Kodak



QUALITY PAPERS

Ultra Glossy 15 sheets (\$1656)

\$14

Satin 15 sheets (D3251)

\$14

Satin 75 sheets (D3258)

\$35

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Delivery Australia-Wide

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About...



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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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HARRIS TECHNOLOGY

SyncMaster 171N 17" LCD Monitor

- 17" TFT computer monitor
- 1280 x 1024 max resolution
- 16.2 million colours
- 140/120 viewing angle (H / V)
- 350:1 contrast ratio
- Ultra slim bezel (13.5mm)

Silver Rent* \$15.40/wk
(F9638)

\$1,374



SyncMaster 955DF 19" CRT Monitor

Graphics Pro Series Features:

- 18" viewable screen
- 0.20mm dot pitch (horizontal)
- 1600 x 1200 max resolution @ 68Hz
- DynaFlat - Infinitely flat tube
- Onscreen digital display
- Smart III surface treatment (Anti-static & anti-glare)
- MPR-II/NUTEK certified
- Plug & play capability

(C3975) **\$549**



SyncMaster 152B 15" LCD Monitor

- 15" Viewable Screen
- 1024 x 768 max resolution
- Colours 16.2M
- H.Frequency 30 ~ 61 kHz
- V.Frequency 56 ~ 75 Hz
- Contrast 450:1

- Luminance 350cd/m2
- Viewing Angle 160°/150° Viewing Angle (H / V)
- Input connectors 15pin D-Sub
- Sync Type separate H/V
- Power 31W (Max.)

Silver Rent* \$10.48/wk (F9637) **\$935**



SyncMaster 151S 15" LCD Monitor

- Optional Pivot to Portrait - head of monitor can be turned.
- 15" viewable screen
- 1024 x 768 max resolution @ 76Hz
- Colours 16.2M
- H.Frequency 30 ~ 61 kHz
- V.Frequency 50 ~ 75 Hz
- Contrast 330:1
- Luminance 250cd/m2
- Viewing angle 140°/120°
- Input connectors 15pin D-Sub
- Sync type composite H/V, SOG
- Power 30W (max.)

Black Rent* \$9.51/wk (D4036) **\$849**



Value for money & leading technology



CML152SXW 2
15" TFT LCD Monitor
XGA 1024 x 768 @ 75Hz
Rent* \$9.13/wk

(F4105)

\$815



CML153XW
15" TFT LCD Monitor
with Speakers - XGA
1024 x 768 @ 75Hz
Rent* \$10.34/wk
(D5744)

\$923



CML181SXW
18" TFT LCD Monitor
1280x1024@85Hz
RGB + DVI Inputs
Rent* \$21.98/wk
(D7709)

\$2,215



CML170SXW PLUS
17" TFT LCD Monitor
1280x1024@85Hz
RGB + DVI Inputs
Rent* \$16.69/wk
(F8885)

\$1,489



CML174SXW
17" TFT LCD Monitor
1280x1024@60Hz
RGB + DVI Inputs
Rent* \$15.56/wk
Ivory (G2012)
Black (G2014)

\$1,389



CML200UXW B
20" TFT LCD Monitor
1600x1200@60Hz
RGB + DVI Inputs
Rent* \$35.20 /wk
(F8911)

\$3,547



CM621
17" Flat CRT Monitor
1024x768@85Hz
0.22mm Horizontal Dot
Pitch

(C9156)

\$385



CM721
19" Flat CRT Monitor
1600x1200@75Hz 0.20mm Horizontal Dot Pitch

Rent* \$7.77/wk
(C8839)

\$694



CM827
21" CRT Monitor
1866x1392@75Hz
0.21mm Horizontal Dot Pitch

Rent* \$17.00/wk
(F1129)

\$1,517

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in stock at all
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NEC

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www.ht.com.au/cat/nec

Nothing Else Compares

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NEC MultiSync LCD1550V

15" LCD monitor

- Native 1024 x 768
- Available in white & black
- Super slim bezel

*High
performance!*



\$899

Rent* \$10.07/wk (D9139)

NEC

V530

15" CRT Monitor
1280 x 1024
(B9125)

\$239

V730

17" CRT
Monitor
1280 x 1024
(B7522)

\$269

V930

19" CRT Monitor
1600 x 1200
(C3739)

\$509

NATURAL FLAT MONITOR RANGE



FE700+

- 17" CRT monitor
- 1280 x 1024 @ 66Hz
- Flat aperture grille

(D1191)

\$319



LCD1700V

- 17" LCD monitor
- 1280 x 1024
- Tiltable screen

Rent* \$13.43/wk (E7297)

\$1,199



LCD1850E

- 18" LCD monitor
- 1280 x 1024 (max res)
- Super slim bezel
- Available in white or black

Rent* \$29.64/wk (E1036)

\$2,199

NEC DATA PROJECTORS AND PLASMA DISPLAYS



VT45

- SVGA; 800 x 600
- 1000 ANSI lumens
- Horizontal & vertical lens shift
- Weighs only 2.5kg

Rent* \$33.72/wk (D1195)

\$3,398

42MP3 PlasmaSync

- 42MP3 PlasmaSync
- 42" plasma multimedia display
- 16:9 aspect ratio
- 160 degree viewing angle



HDTV COMPATIBLE
Stand is not included

Rent* \$88.03/wk (F9573)

\$10,499



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Video Editing Hardware

DV500 DVD

Pinnacle DV500 DVD is the successor to Pinnacle Systems' popular DV500 real time DV editing solution that has a proven track record in stability, reliability and compatibility. Now it's even better with the addition of more real time features designed to streamline the DVD creation process. In addition to direct import of MPEG-2 files to the timeline, Pinnacle DV500 DVD has hardware accelerated MPEG-2 rendering to allow faster transfer of video. It also includes Intelligent ReEditing which allows you to revisit older projects and only render the edits when you've completed your revisions. Pinnacle DV500 DVD is the only choice for high performance video editing.

(F0705) **\$1,336**

**NOW INCLUDES ADOBE
PREMIERE 6.5**



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STUDIO DELUXE

Covert analogue to DV format & vice versa. Full analogue & DV editing solution! Dedicated breakout box for desktop connections. Includes analogue and digital capture card, full version of Studio 8 and Hollywood FX Plus. This is the ultimate home video solution.

**"COMPLETE DVD EDITING
AND CREATION
PACKAGE".**

(F9330) **\$849**



STUDIO DC10 Plus

Studio DC10 Plus - dedicated solution for capturing & exporting your videos to analogue tapes (VHS, SVHS, Hi8 tapes, TV & Webcams). Includes analogue capture and output card and full version of Studio 8.

**"COMPLETE DVD EDITING
AND CREATION
PACKAGE".**

(F9329) **\$489**



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CELLARS
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for
more
products
and
latest
info!

STUDIO DV

Includes IEEE 1394/Firewire Card with 3 ports (2 external, one internal) and full version of Studio 8 **"COMPLETE DVD EDITING AND CREATION PACKAGE".**

(F9326) **\$349**



STUDIO DVClip

The best starting point for DV editing. Looking for an easy, affordable way to edit your DV or Digital 8 movies? Look no further! Studio DVClip comes with a special version of Pinnacle's award winning new Studio software and because it's so stable and easy to use, it's the number one choice for beginners. Includes IEEE1394 FireWire card, IEEE 1394 cable and Studio 7 SE software.



(G1772) **\$149**

Watch TV on your PC!

The Pinnacle PCTV allows you to watch and record TV on your PC. You can record MPEG-1 or MPEG-2 (depending on system speed) and then burn to DVD or CD. The PCTV features scheduled recording, video capture, time-shifting for pausing or replaying a live show WITHOUT AFFECTING THE RECORDING plus lots more!

PCTV



(80290) **\$125**

PCTV Pro



Includes an FM radio tuner as well as stereo sound.

(F0462) **\$238**

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Video & Multimedia Tools

First in Video Technology



EZDV SE

EZDV- Fast, friendly, easy-to-use DC Capture and editing using high quality Canopus Technology.

- > Captures selected clips or complete videotapes
- > High speed rendering
- > High quality CD, DVD and Web export

(F0859) **\$449**

*EZDV SE with Premiere 6.5

(G4309) **\$749**



DVRaptor RT

DVRaptor RT Bundle (Analogue & DV In/Out)

Boasts render-free, real-time digital video editing, DV & analogue input/output, MPEG output for DVD, Internet streaming capabilities, plus a complete suite of digital video production tools.

* Includes DVRaptorRT, ADVC 50 & Adobe Premiere 6.5

(F7695) **\$1,465**

*DVRaptorRT without Premiere

(C5577) **\$999**



DVStorm2

DVStorm2 delivers the industry's highest-quality DV and MPEG, breakthrough realtime performance and a professional, stable studio environment.

- > On board MPEG encoder for lightning fast MPEG encoding.
- > MPEG tools for capture, cutting and re-encoding.
- > Includes Ulead's DVD Workshop SE.
- > Additional filters for StormEdit and Adobe Premiere. (Adobe Premiere optional).
- > 3D Picture in Picture Controls.
- > "One-pass" scene capture utility.

(G1647) **\$2,199**

Convert to DV with the World's Best Technology



ADVC50

Analogue Digital Video Converter

ADVC-50 - Realtime analogue to DV conversion

ADVC-50 allows convenient access to video capturing when fitted into the computer's 5 1/4 - inch bay. The ADVC-50 can also be installed internally as a standard PCI card.

(F1170) **\$489**



ADVC100

Analogue Digital Video Converter

ADVC-100 - Convert analogue to DV and back in realtime

Featuring analog inputs on the front and back, colour bar reference signal generator and automatic input signal detection, ADVC-100 is an affordable, professional converter.

(D4514) **\$699**



ADVC1394

Analogue Digital Video Converter

ADVC-1394 - The world's first OHCI card with native DV & analogue video capture

- > VideoCD, Super Video CD and DVD authoring.*
- > Capture to MPEG-1*, MPEG-2*, and DV.
- > Powerful editing and content creation applications: Vegas Video LE 3.0* and WinProducer 3 DVD*.

*Included software for Windows only

(F4092) **\$599**

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Award-winning DV Technology

Locked Audio Support

NTSC and PAL Compatible

Convert Your S-VHS, Hi8 or Other Analogue Videotapes to DV

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Multimedia Tools

ACID PRO® 4.0

**Powerful, Loop-Based
Music Creation**

ACID PRO® 4* is here! Featuring 5.1 surround mixing, advanced MIDI editing, plug-in effects automation and much more! The best loops editing package just got a whole lot better. Use ACID to create songs, remix tracks, produce 5.1 surround audio mixes, develop music beds, score videos and create music for web.

(G3737) **\$595**

TV Tuner Card & Video Recorder

Hauppauge!

**PVR allows you to watch/record live TV
onto your hard drive in DVD quality (MPEG2)**



Hauppauge PVR USB

(D1776) **\$549**

Hauppauge PVR 250 PCI

Rent* \$6.60/wk (B2593) **\$589**

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Sound Forge 6

**Edit, Record, Process &
Encode Audio on your PC**

This industry-standard application is perfect for audio editing, recording, effects processing and rich media encoding. Version 6 continues to improve by adding features that make it even faster and more powerful than ever!

(B8616)
\$549

Sound Forge Studio 6 also Available (G3738) **\$225**

Video Factory 2.0

VideoFactory 2.0 allows you to capture and edit digital video on your PC. It's perfect for home movies, web videos, music videos, weddings, corporate presentations and much, much more. It's packed with 115 effect presets and 170 customisable transition presets that apply in real-time or you can customise your own! Supports OHCI DV cards.



(D1566) **\$219**

Directory Opus 6.2

Directory Opus goes beyond the simple file manager metaphor and offers you a complete replacement for Windows Explorer plus many other programs for handling FTP, ZIP, Viewing files and images, running slideshows and more!

(G3903) **\$115**

NEW
PRODUCT



Vegas Video 3.0

**Powerful Video Editing
Tools for Screen or Web**

The professionals choice for serious video editing and post production. Featuring support for all OHCI Firewire cards including notebooks, Vegas provides the biggest range of video and audio tools, including MPEG1 and MPEG2 encoding.



(D4411) **\$929**

Hauppauge TV USB

**Watch TV on your
Notebook**

The Hauppauge TV USB and TV USB FM allow you to watch TV on your notebook using its USB interface. The compact external unit also accepts video from a VCR or camera. Basic capturing functionality is also provided.

TV USB (89066)

\$255

TV USBFM Radio (98455)

\$309

Hauppauge TV GO

**Watch TV on your
Desktop**

The Hauppauge TV Go and TV Go FM allow you to watch TV on your desktop, either in a window or full screen. Both models feature Stereo audio, teletext capability, VCR Input as well as basic capturing. FM model comes with a free Remote control!

TV-GO (89063)

\$155

TV-GO FM (89064)

\$197



ACID Music 3.0

(D4410)

\$225

ACID DJ 3.0

(D4342)

\$115

ACID

Techno 3.0

(D9203)

\$115

Sound Forge 6

Academic

(G2979)

\$479

ACID Pro 4

Academic

(G4214)

\$479

Video Factory

Academic

(G4213)

\$145

Hauppauge

DVB-S NEXUS

Satellite

receiver

(G4246)

\$595

Rent*

\$6.66/wk

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**Winfast TV2000 XP
Deluxe TV Tuner**
Microsoft Windows XP
Support Image/Video Capture
Remote Control.
(E6710) **\$145**



***Geforce 4 A250 LE TD
My Vivo Edition Ti 4200**
64MB DDR memory
TV Out and DVI support
Video In functionality
(F7644) **\$399**



**Geforce 4 A170 TH
NVIDIA MX440 GPU**
64MB DDR Memory
TV out support
Hardware Monitoring.
(G3997) **\$195**



***Geforce 4 A250 TD
My Vivo Edition Ti 4400**
128MB DDR memory
TV Out and DVI support
Video In functionality
Rent* \$6.25/wk (F3186) **\$558**



**Geforce 4 A180 TH
My Vivo Edition
NVIDIA MX440 - 8x GPU**
64MB DDR Memory
TV out support
Hardware Monitoring.
(G3982) **\$309**



***Geforce 4 A250 Ultra TD
My Vivo Edition Ti 4600**
128MB DDR memory
TV out and DVI support
Video in functionality.
Twin Turbo cooling
Rent* \$8.39/wk (F7642) **\$749**
*Video capture software included



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hp consumables

ink cartridges



No 29 Black Inkjet Cartridge
(21919) **\$69**

No 45 Black Inkjet Cartridge
(22643) **\$69**

No 78 Tri Colour Inkjet Cartridge
Large (97335) **\$139**

toner



hp c4092a LaserJet print
Cartridge for HP LaserJet 1100, 3200;
2500 page toner (70459) **\$129**

hp 92298a LaserJet Black Print
Cartridge for LJ 4/M, 4+/M+, 5/N/M
6800 page Toner (07995) **\$195**

hp 92298x LaserJet Black Print
Cartridge for LJ 4/M+/M+/5/M/5N
8800 Page Toner (42504) **\$209**

paper



hp c7006a hp photo quality, semi-
gloss, A4, 25 sheets
(C6840) **\$13**

hp q1936a hp premium inkjet
paper, A4, 200 sheets
(D9329) **\$37**

hp c7014a hp colorfast photo
paper T3, A4, 20 sheets
(C6528) **\$53**

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hp deskjets & multifunction printers

hp deskjet 3420

•HP PhotoREt 3 color layering technology - more color shades for incredibly realistic images •up to 2400 x 1200 dpi color printing on photo paper •print longer lasting photos with specially formulated hp fade-resistant inks and photo paper •Prints up to 10ppm in black and 8ppm in colour •On-screen ink level indicator •On-screen print cancel lets you stop unwanted print jobs at a click •USB.



(F7708) **\$145**

hp deskjet 3820

•Photo-quality with HP PhotoREt 3 color layering technology •Up to 4800 optimised dpi in color (on hp colorfast photo paper & 1200 x 1200 input dpi) and rich black text •Specially formulated hp fade-resistant inks and photo papers •One-touch print cancel button •Low-ink indicator light •Prints up to 12ppm in black and 10ppm in colour •Networkable with optional hp jetdirect wired and wireless print servers.



(F7709) **\$189**

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*Delivery charges extra.

For all your short term computer hire needs

hp deskjet 5550

•Get best photo-quality with HP PhotoREt 3 color layering technology •Up to 4800 optimised dpi in color (on hp colorfast photo paper & 1200 x 1200 input dpi) and rich black text •Optional 6-ink color printing with hp PhotoREt 4 color layering technology •Prints up to 17ppm in black and 12ppm in color •Networkable with optional hp jetdirect wired and wireless print servers •Borderless 4" x 6" photo printing on hp colorfast photo paper •Ink backup printing mode •Automatic paper type sensor.



(F7710) **\$275**

hp PSC 750

Print, Scan and Copy

•Prints up to 11ppm in black and 8.5ppm* in colour •Black - 600dpi, colour - PhotoREt 3 (2400 x 1200 dpi using photo paper) •4MB ROM printer memory & 8MB of Synchronous DRAM •HP PCL Level 3 •600 x 2400 dpi optical scan resolution (up to 9600 dpi enhanced) •8-bit greyscale scan quality (256 levels of grey) & 36-bit colour •Copies up to 11cpm in black and 8cpm in colour.



* Print speed may vary dependant on system configuration and document complexity

(C7655) **\$364**

Kwiktron's vast inventory of the latest equipment is in-stock and ready for immediate delivery.
02 9774 8666

hp PSC 2210

Print, Scan, Copy and Fax

•USB connection •1200 x 2400dpi optical scan resolution •300 x 300dpi fax resolution •Prints up to 17ppm in black and 12ppm in colour •Copies up to 17cpm in black and 12cpm in colour •33.6kbps fax speed •Flatbed scanner •Max scan size 8.5" x 11.7" •hp thermal inkjet print technology.



* Print speed may vary dependant on system configuration and document complexity

Rent* \$7.71/wk (G1633) **\$688**

hp D145

Colour All-In-One with high-speed printing and copying

•Print up to 2400 x 1200dpi on hp premium photo paper •Print photos directly from your digital camera's memory card (CompactFlash, SmartMedia, Sony Memory Stick) with hp's photo proof sheet technology - with or without a PC •Get fast printing at up to 19ppm in black, up to 16.8ppm in colour •Copies up to 18ppm in black and up to 16ppm in colour •Fast colour faxing with a 33.6kbps modem •One-touch key pads, speed dials and other fax functions.



Rent* \$12.65/wk (E7707) **\$1,129**

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Extend to a total of 3 Years Return to Base
Extend to a total of 5 Years Return to Base
Upgrade Return to Base or Warranty Extension to On-Site

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hp LaserJet & Business InkJet Printers

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hp LaserJet 1000 USB


 Rent* \$6.56/wk (C9361)
\$586

hp LaserJet 1200 Series


1200
 Rent* \$8.79/wk (B9799)
\$785
1220
 scan/copy
 Rent* \$10.36/wk (B9968)
\$925
1200n 16MB
 Rent* \$14.51/wk (B9958)
\$1,295

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hp Color LaserJet 5500 Series

High-speed A3 colour at an affordable Price
 •Up to 22ppm monochrome and colour •inline technology allows outstanding print speed and quality •600dpi with ImageREt 2400 •Enhanced ease of use •400MHz processor •1100 sheet input tray •96MB printer memory •2 year onsite warranty •120,000 pages per month duty cycle.



hp LaserJet 5500 Rent* \$69.60/wk (G4248) **\$7,820**
 hp LaserJet 5500dn Rent* \$78.14/wk (G4249) **\$8,779**
 hp LaserJet 5500dtn Rent* \$92.97/wk (G4250) **\$11,470**

hp Business InkJet 3000 Series

hp business inkjet 3000 •21ppm black; 18ppm colour •hp PhotoREt 3 •up to 2400x1200dpi •usb/parallel/e2 i/o slots •lcd control panel •duplex printing (std on 3000dtn) •PostScript® 3 emulation



hp Business InkJet 3000 Rent* \$19.60/wk (G4251) **\$1,749**
 hp Business InkJet 3000n Rent* \$23.79/wk (G4252) **\$2,397**
 hp Business inkJet 3000dtn Rent* \$27.47/wk (G4253) **\$2,768**

hp LaserJet 4100 Series

hp LaserJet 4100 series workgroup printers deliver the highest value in their class, with more speed, more capacity and new 'intelligent' e-enabled printer management features. Replacing the hp LaserJet 4050 series, hp LaserJet 4100 series come with enhanced performance and industry-leading reliability.



hp LaserJet 4100 Rent* \$23.97/wk (B8399) **\$2,139**
 hp LaserJet 4100n Rent* \$28.06/wk (B8400) **\$2,828**
 hp LaserJet 4100tn Rent* \$32.59/wk (B8401) **\$3,284**
 hp LaserJet 4100dtn Rent* \$36.95/wk (B8402) **\$3,723**

hp LaserJet 4300 Series

•64MB RAM •350MHz processor •two optional EIO interface slots •100 sheet multipurpose input tray •500 sheet input tray (media capacity 600 sheets) •50 sheet face up output tray •250 sheet face down output tray.



hp LaserJet 4300 Rent* \$28.55/wk (G4258) **\$2,877**
 hp LaserJet 4300N Rent* \$36.27/wk (G4259) **\$3,655**
 hp LaserJet 4300TN Rent* \$39.36/wk (G4260) **\$4,160**
 hp LaserJet 4300DTN Rent* \$44.86/wk (G4261) **\$4,721**

hp Color LaserJet 2500 Series

•16ppm black, 4ppm colour •Half the cost of a CLJ4600 •Very quiet when operating •125 sheet MP tray & 250 sheet cassette (2500 & 2500N Models) •125 sheet face down output (250 & 500 paper trays available) •Straight thru paper slot for thick media •ImageREt 2400 •64MB RAM (all configurations) expandable 256MB.



hp LaserJet 2500L (Lite Version) Rent* \$23.39/wk (G0177) **\$2,357**
 hp LaserJet 2500 (Base Unit) Rent* \$28.21/wk (F8656) **\$2,843**
 hp LaserJet 2500n (Networked) Rent* \$33.38/wk (F9812) **\$3,364**

hp LaserJet 3300 & 3330mfp

•Up to 14 ppm (A4 size) •Compact size to save office space •The HP Ultra Precision print cartridges print more than 2,500 pages each •Optional high capacity cartridge print up to 3,500 pages •Duty cycle of 10,000ppm/month •One year warranty •Digital copying 14cpm, 600 x 600dpi •Flatbed scanner scans up to 216 x 381, 600ppi colour •90MHz •32MB RAM.



hp LaserJet 3300 digital print-copy-scan Rent* \$12.72/wk (E3828) **\$1,135**
 hp LaserJet 3330mfp print-fax-copy-scan Rent* \$17.31/wk (E3864) **\$1,545**

hp LaserJet 4200 Series

•48MB RAM •300MHz processor •two flexible EIO interface slots •100 sheet multipurpose input tray •500 sheet input tray •50 sheet face up output tray •auto duplex unit •hp Jetdirect 615n fast ethernet internal EIO print server •additional RAM (up to 416MB) •75 sheet envelope feeder •500 sheet stacker •500 sheet stapler/stacker.



hp LaserJet 4200 Rent* \$23.24/wk (G4255) **\$2,342****
 hp LaserJet 4200n Rent* \$30.97/wk (G4256) **\$3,121****
 hp LaserJet 4200tn Rent* \$36.08/wk (G4257) **\$3,636****

SPECIAL PROMO

Receive a **FREE hp color inkjet cp1700** printer when you purchase **2 hp mono printers.**

Buy 2 hp LaserJet 2200 network connected printers (dn/dtn models only)

OR

Buy 2 hp LaserJet 4100 network connected printers (n/t/dtn models only)

Terms and Conditions Apply

•This offer is valid until 31st December 2002 or while stocks last.
 •This offer cannot be combined with any other offer or special pricing or education/government deal.
 •Both units must be in the same HP LaserJet series and on a single invoice.

Lifetime warranty on printers*

A Xerox Phaser colour printer is not just for Christmas – it's for life.

Lifetime Extended Warranty*

Xerox's experience and trusted reliability are at the heart of all Xerox Phaser colour laser class printers. For a limited time, Fuji Xerox Phaser Printing is offering a world first **lifetime extended warranty** from only \$699 RRP on the selected Xerox Phaser colour printers below* – so you can have high performance printing in your office with peace of mind. Terms & Conditions Apply.

Bonus Digital Camera/Cash Back Offer*

Receive a bonus digital camera or \$500 cash back* when you buy any of the new Xerox Phaser printers below and trade in your old laser printer. Terms and conditions apply.



Image for illustration purposes only

*For full terms and conditions, trade in claim form and a sample Lifetime Warranty agreement
www.XeroxPrinters.com.au/ht



Image for illustration purposes only

• 16ppm • 4 configurations available

Xerox Phaser 8200

The affordable Phaser 8200 A4 colour printer offers the most easy to use, flexible and environmentally friendly office colour printer platform. Producing consistently vibrant colour prints at up to 16 ppm colour and black & white, the 8200 is ideal for any office application. Available in 4 std. configurations.

Rent* \$36.85/wk (F3977)

\$3,895

Optional lifetime warranty only \$699^{RRP}



Image for illustration purposes only

• 16ppm • 4 configurations available

Xerox Phaser 6200

The Xerox Phaser® 6200 A4 colour printer prints high-resolution full-page colour at 16 ppm in both colour and black & white. With stunning print quality of up to 2400 x 600dpi, the 6200 offers the print speed and performance ideally suited to a high volume office. Available in 4 std. configurations.

Rent* \$44.93/wk (F4374)

\$4,749

Optional lifetime warranty only \$699^{RRP}



Image for illustration purposes only

• 22ppm • 4 configurations available

Xerox Phaser 7700

The Xerox Phaser® 7700 A4/A3+ colour laser printer combines exceptional colour quality with the phenomenal speed of 22 ppm for both colour and black & white. The 1200 dpi print quality and automatic colour calibration provides consistent colour imaging every time across a broad range of media. Available in 3 std. configurations.

Rent* \$129.00/wk (D5185)

\$15,914

Optional lifetime warranty only \$1,499^{RRP}

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Digital Cameras.....

CanonPowerShot IXUS V3

NEW

- 3.2MP, 1/2.7" CCD image sensor offers 2080x1542 pixel resolution
- Retractable 2x f/2.8-4.0 zoom lens with smooth 3.2x digital zoom
- Selectable 9-point AI/AF and single centre point AF allows framing of subject in almost any position within the frame
- New DIGIC image processor, AF accuracy and processing speed.



Rent* \$10.86/wk (G4119) **\$969**

CanonPowerShot G3

NEW

- High resolution 1/1.8" 4MP CCD •Big 4x aspherical zoom lens equivalent to 35 - 140mm with a fast f/2-3.0 aperture
- Advanced single point "FlexiZone AF/AE" autofocus •EOS based shooting modes •Complete range of creative exposure control modes •Comprehensive assortment of system accessories.



Rent* \$19.58/wk (G4632) **\$1,747**

CanonPowerShot S45

NEW

- High resolution 4MP CCD image sensor
- Fast 3x aspherical zoom lens-equivalent to 35-105mm f/2.8-4.9 in 35mm format •Compact all-metal capsule style design •Complete range of creative control modes •Newly developed DIGIC image processing engine •Improved AF accuracy and greater processing speed.



Rent* \$15.42/wk (G4535) **\$1,376**

CanonPowerShot A200 2.0MP

- Fixed-focal length, auto focus, 5mm f2.8 lens
- PC/TV display •Up to 30sec movie recording
- USB plug and play •Auto loading software for trouble free transferring, printing & image storage.



(F4062) **\$375**

Canon PowerShot A30 1.2MP

- Canon 3x optical zoom lens •Built-in flash •USB interface •LCD monitor, TFT colour •Shutter speed: 15-1/1500 sec.



(E3967) **\$489**

Canon PowerShot A40 2.0MP

- Movie recording and playback with audio •Five photo effect modes •3x optical zoom lens, 7.5x with digital zoom •Built-in flash •USB interface •LCD monitor, TFT colour.



Rent* \$7.61/wk (E3969) **\$679**

Canon

Scanners.....

5000F Flatbed Scanner



(G4633) **\$469**

- 4 times faster than previous model 2400dpi scanners.
- 2400dpi Hyper CCD sensor with 48 bit colour depth.
- Fast USB 2.0 high-speed interface.
- Automatic dust and scratch removal technology (FARE) for film scanning.
- Continuous scanning of 3 frames of 35mm. films strip in a single pass.

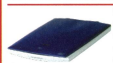
8000F Flatbed Scanner



(G4634) **\$568**

- 2400dpi Hyper CCD sensor with 48 bit colour depth.
- 2400dpi hyper CCD sensor with 48 bit colour depth.
- Fast USB 2.0 high-speed interface.
- Automatic dust and scratch removal technology (FARE) for film scanning.
- Continuous scanning of 12 frames of 35mm films strip in a single pass.

N640Pex Flatbed Scanner



(D4026) **\$125**

- Optical resolution of 600 x 1200dpi.
- 42-bit input.
- Only 4cm tall.
- Parallel interface.
- Scans up to A4 size (quiet operation).
- Complete software package, LIDE Technology.

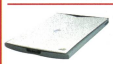
LiDE20 Flatbed Scanner



(F9858) **\$165**

- One touch scan, copy and email.
- USB interface.
- 600 x 1200 dpi.
- 48-bit input.
- 24-bit output.

N1240U Flatbed Scanner



(C7589) **\$229**

- Amazing 1200 x 2400dpi optical with selectable resolution up to 9600dpi.
- Stylish charcoal and aluminium finish.
- New Z-lid for scanning thick books etc.
- Software included: OmniPage and PhotoShop Elements.

D1250U2 / D1250U2F Flatbed Scanner



(E1246) **\$218**

• with 35mm Film Scanning (E1230) **\$299**

- High Speed At The Right Price.
- 1200 x 2400 dpi optical resolution.
- USB 2.0 for faster scanning.
- Easy one touch control.
- Software included: Photo Studio 2000 and Omnipage Pro 9.0.



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Laser Printers.....

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1120 Laser Printer

NEW



- 600 x 600(max 2400 x 600 dpi with A.I.R.).
- 10 ppm A4 size.

- 125 sheet holder
- Letter, legal A4, B5, transparency film, labels, envelopes, index cards.

(G4580) **\$459**

ImageCLASS MPC 200

NEW



- 3-in-1 flatbed
- Print, copy, scan, memory card printing.
- Up to 14 pages per min (mono).
- Up to 10 pages per min (colour).
- 2400 x 1200 dpi.

(G4582) **\$468**

ImageCLASS MPC 600F

- 5-in-1 flatbed (print, fax, copy, scan, PC fax).
- Up to 17 ppm (mono).
- Up to 12 ppm (colour).
- 2400x1200 dpi.



Rent* \$9.48/wk (F4136) **\$846**

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- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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Inkjet Printers.....

i320 Bubble Jet Printer

NEW



- Up to 2400 x 1200dpi
- Up to 10ppm black
- Up to 7ppm colour
- Borderless 6" x 4" photo prints
- Advanced microfine technology to deliver microscopic 5pl ink drops

(G4584) **\$175**

530D Bubble Jet Printer

NEW



- Direct printing from compatible Canon digital cameras
- Print direct from a range of memory cards
- 4 individual ink tanks for economical operation
- 5pl ink droplets for sharper images.
- 2400 x 1200 dpi

(G4585) **\$577**

S330 Bubble Jet Printer



- Up to 14ppm black and white . and 10ppm colour printing.
- Full bleed photo print.
- Up to 2400 x 1200dpi resolution.
- USB interface for Windows®.
- Colour lasts up to 25 years using Canon's photo paper pro.

(G2318) **\$239**

S830D Bubble Jet Printer



- 6 colour ink system.
- 2400 x 1200 dpi.
- Bubble Jet direct memory card printing.
- USB 2.0 full speed.
- Perfect photo printing.

Rent* \$9.80/wk (G2457) **\$875**

S100SP Bubble Jet Printer



- High speed printing, up to 5ppm black text and up to 2ppm colour.
- USB interface for Windows®.
- Dual ink drop sizes for fine printing.
- 720 x 360dpi.

(E4209) **\$105**

S200SP Bubble Jet Printer



- Up to 5ppm black & white printing.
- Up to 2880 x 720dpi print resolution.
- Colour lasts up to 25 years using Canon's photo paper pro.
- USB interface for Windows®.

(E1132) **\$149**

S520 Bubble Jet Printer



- Prints up to 14ppm black and white and 9ppm colour.
- Up to 2400 x 1200dpi print resolution.
- Colour lasts up to 25 years using Canon's photo paper pro.
- Connect to USB or parallel.
- Replace all four ink tanks individually.

(E1136) **\$359**

S900(A4)/S9000(A3) Bubble Jet Printer



- S900 prints A4 Photos in approx 1min
- 2400 x 1200 print dpi • Six individual photo ink tanks.

Rent* \$8.23/wk (E1135) **\$735**

S9000 prints A3 photos in approx 2min

Rent* \$11.75/wk (E1248) **\$1,049**



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NEW!



Magicolor 2300 DeskLaser

The InkJet Killer

A colour laser printer under \$2000 without the killer inkjet running costs. Armed with high resolution, high capacity and high quality output this guy leaves nothing but a small footprint and carries a tiny cost of ownership.

Rent* \$21.28/wk (F7927)

\$1,899

Print Speed	Up to 4 ppm colour A4, 16 ppm mono
Resolution	2400 x 600 dpi
Interface	Ethernet (10/100BaseTX); USB 1.1; Parallel; optional Bluetooth
Compatibility	Windows 95/98/2000/NT/XP



Great gift idea's!

NEW!



PagePro1200W

Desktop Monochrome Printing

To break away from the pack and take the lead, you need office equipment that enables you to do more with fewer resources. With a 3 year exchange warranty that includes the drum, the PagePro 1200W has amazing printing efficiency.

Rent* \$6.69/wk (F9324)

\$597

Print Speed	Up to 12 ppm
Resolution	1200 x 1200 dpi
Interface	USB 1.1; IEEE 1284 Parallel
Compatibility	Windows 95/98/2000/NT/XP

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.



PagePro 9100N

Networkable A4 & A3 monochrome laser printer

The PagePro 9100N represents the best value in A3 network printing! Even with print speeds of 35 pages per minute and free Ethernet interface, its price matches what you'd expect to pay for smaller, slower laser printers.

Rent* \$37.37/wk (E3659)

\$3,766

Print Speed	35 ppm A4, 19 ppm A3, mono
Resolution	1200 x 1200 dpi
Interface	USB 1.1; IEEE 1284 Parallel; 10/100BaseTX Ethernet
Compatibility	PostScript 3, PCL 6, PDF, HP-GL, PCL 5e

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

spotlight



Magicolor 3100

16 ppm A4 tandem colour laser printer

Finally there's a desktop colour laser printer for business that prints just as fast in colour as it does in black and white. The Magicolor® 3100 delivers up to 16 pages per minute to get the job done. It also has automatic duplexing for two-sided printing.

Rent* \$45.87/wk (D9169)

\$4,849

Print Speed	16 ppm colour & mono
Resolution	1200 x 1200 dpi
Interface	USB 1.1; 10/100 BaseTX Ethernet, IEEE 1284Parallel
Compatibility	PostScript 3, PCL6, PDF, HP-GL

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The Power to Create

PRINTER

EPSON STYLUS 915

NEW

- 5760 optimised dpi using RPM technology +4 picolitre Micro Dots, for extremely fine print detail •EPSON Intellidrive ink system* •True Border-free edge-to-edge printing on cut sheet or roll paper •Roll paper holder included
- Over 25 years lightfastness using EPSON ColorLife paper •Optional LCD Preview Monitor.

(G3333) **\$458**

COLOUR LASER PRINTER

EPSON STYLUS 925

NEW

- 5760 optimised dpi using RPM technology +4 picolitre Micro Dots, for extremely fine print detail •EPSON Intellidrive ink system •True Border-free edge-to-edge printing on cut sheet or roll paper •Roll paper holder and auto-cutter
- Over 25 years lightfastness using EPSON ColorLife paper •Multiple card slots.

Rent* \$9.40/wk (G2351) **\$839**

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PRINTER

EPSON STYLUS C61

- Crisp text, vibrant colours coupled with speed and reliability •Up to 14ppm black text A4 (memo) printing •5760 x 720 optimised dpi using RPM technology
- USB and Parallel enabled.

(F8180) **\$214**

PRINTER

EPSON STYLUS C41UX

- Up to 12ppm black text printing (at economy mode) •Up to 1440dpi photo quality printing resolution •USB-enabled and complete with cable •Intelligent ink system •Fast, easy set-up and operation.

(F0853) **\$119**

PRINTER

EPSON STYLUS PHOTO2100

- Up to 2880 x 1440 dpi •7 colour individual ink system with a new light black and either photo or matte black •A3+ •Epson Intellidrive ink system •True Border-free printing
- Roll paper printer and auto cutter •75yrs lightfastness •Up to 1.3mm thick media support.

Rent* \$20.66/wk (F2969) **\$1,844**

PRINTER

EPSON STYLUS PHOTO1290S

- A3+ •6 colour photo printing •Border-free edge-to-edge printing •Max res 2880 x 720dpi with variable sized droplet technology •Over 20 years lightfastness prints •Features print image matching technology
- On demand inkjet (piezoelectric) •Black text 9.4ppm (economy) •Text & photo 3.0ppm (normal) •Full page colour 1.3ppm (normal).

Rent* \$11.18/wk (G4593) **\$998**

PRINTER

EPSON STYLUS PHOTO 830

- 6-colour ink system •Up to 14ppm black text printing A4 economy •5760 optimised dpi using RPM technology for true photo quality •MicroPiezo print head technology •Incredible fine 4 picolitre ink droplets •True Border-free printing •USB and parallel interface •Over 25 years lightfastness.

(G2192) **\$349**

COLOUR LASER PRINTER

EPSON ALC4000

- Up to 16ppm in full-colour! •Less than 30 seconds warm up time •True 1200dpi, with AcuLaser 2400dpi Class RIT •192MB, expandable to 1,024MB
- Networking and duplexing standard •Large paper capacity with versatile paper handling •Advanced job management including confidential job printing (requires optional hard drive).

Rent* \$49.36/wk (F3409) **\$5,349**

MONO LASER PRINTER

EPSON EPL-5900

- 12ppm •True 1200dpi resolution •200MHz RISC processor •USB & IEEE1284 parallel interface •8MB memory – expandable up to 136MB •Standard 250 sheet multi purpose tray & optional 500-sheet lower paper cassette unit.

Rent* \$7.49/wk (E5160) **\$669**

MONO LASER PRINTER

EPSON EPL-5900L

- The class leading desktop laser printer. Fast durable and high quality for the value conscious home and small office •Superior print quality •Fast 12ppm •1200dpi class resolution.

(E5318) **\$495**

EPSON EXPRESSION 1640XL



- The Expression 1640XL A3+ scanner features EPSON's most advanced scanning technologies providing high speed, maximum detail and superior sharpness and clarity.

Rent* \$49.82 /wk (B1330) **\$5,399**



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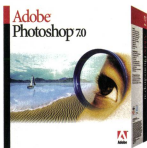
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(G1995)
\$2,915

ADOBE PAGEMAKER 7.0
(C6226)
\$1,149

ADOBE PHOTOSHOP ELEMENTS 2.0
(F7751)
\$175

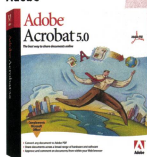
ADOBE AFTER EFFECTS 5.5
(E1138)
\$1,499

Adobe Photoshop 7.0
The professional image editing standard!
(E4018) **\$1,395**



This professional image-editing standard software, helps you work more efficiently, explore new creative options and produce the highest quality images for print, the web and anywhere else. Create exceptional imagery with easier access to file data, streamlined web design and faster professional quality photo retouching.

Adobe Acrobat 5.0
The best way to share documents online!
(B9398) **\$505**



This software lets you convert any document to a Portable Document Format (PDF) file. Anyone can open your PDF across a broad range of hardware/ software and it will look exactly as you intended: with layout, fonts, links and images intact. Increase productivity by approving and commenting on documents within a web browser.

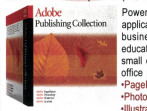
Adobe Design Collection 6.0
(E7819) **\$2,165**



Contains the following leading edge design and publishing applications in one fully integrated suite:
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•Photoshop 7.0
•Illustrator 10.0

*Acrobat 5.0. Together these programs give you everything you need to create & produce professional images, illustrations & layouts and to publish documents across media.

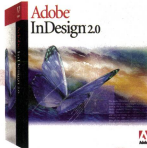
Adobe Publishing Collection 12
(E7784) **\$2,289**



Powerful applications for business, education and small office / home office professionals:
•PageMaker 7.0
•Photoshop 7.0
•Illustrator 10.0

*Acrobat 5.0. This software, along with included templates and graphics, will help you to create and deliver graphically rich communications for print and the web.

Adobe InDesign 2.0
Setting new standards for professional layout and design!
(D1553) **\$1,599**



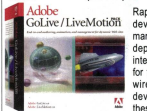
Delivers the creative tools you've always wanted. Integrates with Photoshop, Illustrator and Acrobat. Packed with intuitive features that reduce elaborate design tasks to a few quick steps, freeing you to be more creative. Also makes it easy for you to move beyond print with built-in support for publishing pages anywhere - to PDF and more.

Adobe Premiere 6.5
The essential tool for digital video editing!
(F7756) **\$1,275**



NEW
Delivering unmatched hardware support, Adobe Premiere 6.5 software is the most adaptable DV editing tool on the market today. Now you can work more productively with real-time editing capabilities, and you can take advantage of the sophisticated new Adobe Title Designer, MPEG-2 export, DVD authoring, powerful audio tools, and more to create extraordinary video productions.

Adobe GoLive/LiveMotion Bundle
(E0669) **\$1,055**



Rapidly animate, develop, manage and deploy dynamic interactive sites for the web and wireless devices with these two programs. This bundle includes •GoLive version 6.0 and •LiveMotion version 2.0.

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Adobe The Transactional Licensing Program (TLP) is tailor-made for companies that want to reduce software unit costs and simplify purchasing, without committing to future product purchases. With as few as three product licenses purchased in one transaction, you can get immediate savings. Plus, you get access to Adobe's Web-based licensing tool to manage your Adobe software licenses. And you can add the Maintenance program, which ensures that you have the latest Adobe software whenever it is released over a two-year period.

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What today's CAD designers want

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AutoCAD® 2002



AutoCAD LT® 2002 is the only 2D CAD program providing 100 percent DWG compatibility with AutoCAD® 2002 based products. That means you can open, edit, and exchange drawing files (DWG) with complete confidence.



With AutoCAD® 2002, you can get your design information where it's needed—quickly, easily, and accurately. Its design collaboration tools help you maximise the value of your design data by sharing files, accessing design resources, and meeting in real time with the entire project team. With powerful features such as CAD standard management tools, associative dimensioning, new object snaps, 3D Orbit and more.

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Autodesk Architectural Desktop 3.3 (C1823)



Autodesk Inventor™ Series 5 (includes Autodesk Mechanical Desktop 6 & Autodesk Inventor™) (E4937)



Autodesk Land Desktop 3.0 (C9623)

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Bring your designs alive with Autodesk VIZ 4, a multimedia software tool that provides a visually rich, 3D, interactive user interface. Autodesk VIZ 4 is easy to use & is interoperable with AutoCAD® applications. Upgrades also available.

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Volo™ View 2

Volo™ View 2 software is a cost-effective, easy-to-use, digital design viewing solution that lets everyone on your team electronically review, mark up, measure, and plot AutoCAD® and Autodesk Inventor™ based drawings. Upgrades also available.

(D1736) **\$365**



AutoSketch® 8

From concept sketches, information graphics and floor layouts to presentations, electrical drawings and home project plans, you can draw it - quickly and accurately - with AutoSketch® Release 8 software.

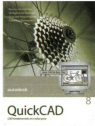
(D9136) **\$227**



QuickCAD™ 8

Begin designing on a computer right away with QuickCAD™ Release 8. Plenty of productive features let you make technical designs and diagrams, and you can start drawing the very first time you use it.

(D5996) **\$143**



Symbols 2000 Architectural

Using the toolbar-style interface, you can find 5,600+ of the most commonly used symbols with only 2 mouse clicks and easily insert them into your drawings.

(A1319) **\$149**



Symbols 2000 Engineering

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Professional web development solution!

Now anyone can update, add and publish content to existing websites without knowing HTML. With Macromedia Contribute non-technical users can update any HTML website — including sites built in Dreamweaver, FrontPage, and other tools, without affecting the quality of existing HTML code. For web professionals, this means spending less time on content maintenance while retaining control over website style, layout, permissions, and code. Contribute is a stand alone product that also works seamlessly with Dreamweaver MX and supports Dreamweaver templates, so web professionals can quickly integrate Contribute into their existing workflow. Plus, Contribute adds new functionality into Dreamweaver MX, providing powerful file versioning and administration capabilities.

FULL VERSION (G4726) **\$239^{RRP}**



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The Essential Suite of Tools for Building Rich Internet Applications

Macromedia Studio MX is the integrated suite of easy, powerful, and open development tools for creating Rich Internet Applications that can be delivered across major platforms and devices. It includes Macromedia Flash MX, Dreamweaver MX, Fireworks MX, FreeHand, ColdFusion MX Server Developer Edition and Macromedia Flash Player 6. Macromedia Studio MX provides the essential tools for creating everything from static websites to Rich Internet Applications. The suite supports each stage of the web production process, including creating graphics, laying out HTML pages, coding application logic, building user interfaces and assembling complete solutions.

FULL VERSION (E9963) **\$1,659**



macromedia **FLASH MX**

The Standard for High Impact Web Content and Applications

Provides everything developers need to create and deploy rich content and powerful Internet applications. New video, colour management and enhanced graphic tools extend creative capabilities. Pre-built templates, interface components, an improved timeline and tighter integration with FreeHand and Fireworks reduce development time. Enhanced HTML support and ActionScript programming tools let designers and developers leverage their existing skills and provide a complete Internet application development environment.

FULL VERSION (E4014) **\$999**

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The best solution for Web graphics!

The easiest way to create, optimise and export interactive graphics in a single, web-centric environment. Includes the tools to make every person responsible for creating web graphics successful, from the HTML developer who maintains and edits graphics to the design expert who demands the most professional bitmap editing control. Delivers a streamlined environment for creating everything from simple graphical buttons to sophisticated rollover effects and pop-up menus.

FULL VERSION (F0193) **\$639**

UPGRADE (F0337) **\$319**

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Professional web development solution!

An easy, powerful and open authoring tool. For the first time designers, developers and programmers can work within one environment to easily create and manage any professional website, whether it's built using HTML, XHTML, XML, web services, ColdFusion, ASP.NET, ASP, JSP or PHP.

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Rapid server-scripting environment for creating rich Internet applications. Combining highly approachable scripting, effortless connectivity to enterprise data and powerful built-in search and charting capabilities, lets developers easily build and deploy dynamic websites, content publishing systems, self-service applications, commerce sites, and more. Supports Windows, Linux, and UNIX operating systems.

FULL VERSION PRO (F0364) **\$1,445**

UPGRADE from V4.5/5.0 PRO (F0368) **\$987**

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DIRECTOR 8.5 SHOCKWAVE STUDIO

Create a wide range of highly interactive 3D applications including games, e-commerce, e-learning and product demonstrations.

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CorelDRAW® Graphics Suite 11

CorelDRAW 11 delivers graphic design and vector animation software for print and the web. Unique interactive tools set it apart, saving you time and making the design process easier. For example, new 3-point ellipse, rectangle and curve tools let you create and position shapes in two clicks. The new convert to curves tool allows you to apply artistic effects to blocks of text.

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Intuitive graphic design for print and the Web

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- KPT® Scatter™ - spread particles over image.



FULL
VERSION
(D1534)
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Bryce® 5

- Create realistic 3D landscapes and animations
- New! Network Rendering saves valuable time by letting you render images on multiple computers.
- New! Light Lab - more robust control over lighting on objects and in landscapes
- New! Tree Lab ensures a more accurate depiction of real-world environments.

FULL VERSION (C5869) **\$389**

UPGRADE (C9209) **\$253**



Ventura® 10

- Professional publishing solution, it helps transform long, complex files into highly formatted and visually rich publications
- New! Support to PDF
- New XML import
- Enhanced Compatibility - import a wide range of file formats, including Microsoft® and Adobe® applications.

FULL VERSION (G0136) **\$1,519**

UPGRADE (G0171) **\$549**



Painter® 7

- Image editing and digital illustration
- Add unique painting effects to photos and designs
- Works in sync with Adobe® Photoshop®
- New Watercolour technology - see paints drip and blend together as they are applied
- New Liquid Ink layer mimics the viscosity and surface tension of a thick, gluey medium like ink or paint.

FULL VERSION

(C9237) **\$825**

UPGRADE

(C9239) **\$455**



KnockOut 2.0

- Quickly performs complex masking and preserves fine image details such as hair, smoke, water, glass, shadows or blurred or out-of-focus edges
- Plugs straight into Adobe® Photoshop® toolbar
- Work with images in either RGB or CMYK mode

FULL VERSION

(D3901) **\$693**

UPGRADE

(D3905) **\$307**



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- A complete office solution which interacts with other desktop productivity suites including Microsoft Office
- Includes: •WordPerfect® 10 - word processor
- Quattro® Pro 10 - spreadsheet (both read, write, edit & save in Microsoft formats)
- Corel Presentations™ 10 - slide show creation
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(F4199) **\$189**



iGrafx® FlowCharter™ 2003

- Diagrams with built-in intelligence to aid in problem solving & decision making
- Publish Web Project - manages the publishing process to the Web
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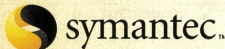
RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

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Symantec AntiVirus Small Business Solutions	Small Business Edition	Small Business Edition plus AV Filtering for MS Exchange	Small Business Multi-Tier Protection	Symantec Client Security
Multipacks 5 & 10 users	✓	✓	✓	✓
Desktop AV Protection	✓	✓	✓	✓
Network Server Protection	✓	✓	✓	✓
Administrator Settings	✓	✓	✓	✓
Management Console	✓	✓	✓	✓
1 Year Upgrade Insurance	✓	✓	✓	✓
1 Year Technical Support	✓	✓	✓	✓
Desktop Firewall Protection				✓
Intrusion Detection				✓
MS Exchange Mail Server Protection		✓	✓	
Gateway AV Protection			✓	
Lotus Domino Mail Server Protection			✓	
5 User	(G0215) \$699	(G0218) \$825	(G4537) \$1,139	(G1129) \$1,295
10 User	(G0216) \$1,199	(G0219) \$1,405	(G4536) \$2,015	(G1130) \$2,293



Symantec Firewall/VPN Appliance (Models 100, 200, 200R)

Easy-to-Use, All-in-One Appliance comes in three models to meet varying network traffic and remote access requirements, with no per-user licencing requirements. Installs quickly and easily, offering small offices a turnkey solution for securing outbound and inbound Web, email, FTP traffic and more.



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(5 ports)—Provides plug and play networking, web access and firewall and VPN security for up to 25 users*.

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• Symantec Firewall/VPN Model 200

(10 ports)—Brings firewall and VPN protection, load-balancing and high availability to offices with up to 40 users*.

Rent* \$18.77/wk (E0960) **\$1,675**

• Symantec Firewall/VPN Model 200R

(10 ports)—Brings firewall and VPN protection, load-balancing and high availability to offices with up to 40 users*. Also includes the remote Symantec VPN Client (with integrated personal firewall) that lets you set up a remote virtual private network to securely connect mobile users.

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*No licence limitation on the number of users/nodes.

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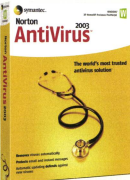
Bonus Grease Video Offer

when you purchase a participating Symantec products*. Offer valid via mail-in redemption. See sticker on box for details. Offer ends January 13, 2003. *Norton AntiVirus™ 2003, Norton AntiVirus™ 2003 5 User, Norton Personal™ Firewall 2003, Norton Utilities™ 2002.



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Norton AntiVirus™ 2003



Symantec's Norton AntiVirus™ 2003 is the world's most trusted antivirus solution. Now this easy-to-use program scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work. Automatic updates help defend your PC against new viruses. Automatically detects and blocks worms in outgoing email messages, stopping them from sending themselves out to others.

(F9859) **\$93**

NEW
Version

Norton Personal™ Firewall 2003

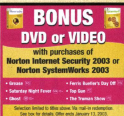


NEW Version
Norton Personal™ Firewall 2003 keeps hackers out and personal data in. Secure your PC today with Norton Personal™ Firewall, your maximum defence against hackers and privacy threats.

(G0282) **\$83**

Bonus DVD or Video

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Norton SystemWorks™ 2003 Standard

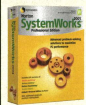


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Norton SystemWorks™ 2003 Professional Edition

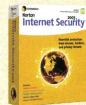


(F9863) **\$169**

- Includes:**
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 - Norton Utilities™
 - Norton CleanSweep™
 - Norton Ghost™ 2003

Symantec's Norton SystemWorks™ 2003 Professional Edition provides advanced problem-solving solutions to maximise PC performance, includes full version of Norton Ghost™ 2003.

Norton Internet Security™ 2003 Standard



(G0279) **\$123**

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Norton Ghost™ 2003



Symantec's Norton Ghost™ 2003 protects your data from computer disasters. Use it to create regular backups easily, recover files quickly and safely, or upgrade your PC.

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Host & Remote
(D8088) **\$239**

V10.5 / 5 User
(D5935) **\$479**

Norton WinFax Pro V10.02



WinFaxPro Version 10.02 easily integrates with key business applications to simplify management of client and customer interactions. Send or forward faxes via email, enhance image quality of outgoing faxes easily, add a

signature to outgoing faxes, drag and drop faxing.
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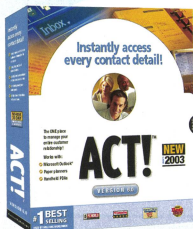
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ACT! V6.0

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ACT! V6.0 - 6pack

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FileMaker Mobile 2.1

FileMaker Mobile 2.1 lets you easily synchronise information between local FileMaker Pro 5.5v2 and 6 databases and a handheld device. New version 2.1 adds compatibility with bar code scanning devices on Pocket PC and HandSpring Visor (Palm OS) handhelds using the Symbol barcode.

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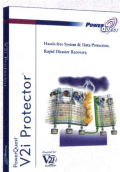
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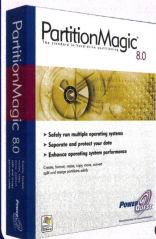
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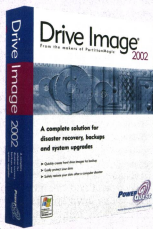


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Drive Image is a Complete Solution for Disaster Recovery, Backups & System Upgrades
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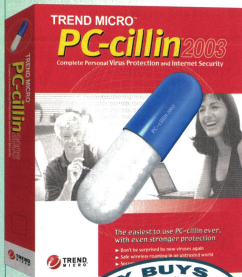
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PC-cillin 2003 New

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PC-cillin 2003

NEW



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Guards against known harmful script-based viruses and also from new unknown viruses.

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PC-cillin 2003 integrates the increased ability to detect unknown viruses using advanced heuristic technology. Unlike other antivirus software that only offers general heuristics, PC-cillin 2003 provides a customised heuristic scan to target specific virus file types. This makes detection more precise and powerful. Best of all, this technology is integrated with the scan engine and works automatically every time a scan is performed.

Outbreak Alert:

Trend Micro PC-cillin 2003 offers an industry-first, advance warning service: before a serious virus outbreak can strike, you have time to immediately update PC-cillin and protect your computer from infection, no matter when your next auto update is scheduled.

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PC-cillin can scan messages and attachments retrieved from POP3 mail servers and attachments from Webmail servers (email that is stored on a server and accessed by a Web browser).

Enhanced Personal Firewall:

Built from the ground up, PC-cillin's enhanced Personal Firewall provides solid protection to help prevent intrusion attempts from unauthorised users while you are connected to the Internet. The PC-cillin Personal Firewall is a stateful packet inspection firewall. Unlike packet filter firewalls, stateful packet inspection firewalls not only examine the headers of a packet, but also the contents.

WebTrap

PC-cillin 2003 WebTrap™ has been enhanced to minimise any decrease in speed while viewing Web pages. Now PC-cillin offers solid protection from malicious scripts without causing any significant decrease in Web viewing time.

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Protect important information on your PDA, and secure your PC during synchronisation, an extensive solution for the Internet and wireless era.

Wi-Fi Protection

With PC-cillin, you can quickly secure your wireless Ethernet access points with a click. This protects your computer when you are roaming in an un-trusted area.

- Automatically scans for scripting viruses based on 'what they do' rather than how they are written.
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*To be eligible for Microsoft Works Suite, you must be a licensed user of any one of the following Microsoft® applications: Works (all versions), Word (version 6.0 or later for MS DOS, Windows and Windows NT Workstation), WordPerfect for MS-DOS (4.0 to 5.1), WordPerfect for Windows (5.1 - 9), Productivity Suites from Novell and Corel which contain these WordPerfect versions.

(F8718) **\$179**

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Links 2003 delivers the most realistic golf experience on your PC. The newest version of history's best-selling golf series takes you to six all-new championship courses, giving you more realistic control over every shot with the all-new real-time swing. Create your own character and play against some of the hottest pros in your own professional career, then design your home course with the Arnold Palmer Course Designer and share it online.

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Links 2003 Championship Courses Expansion Pack
Includes Royal Melbourne Golf Club! (G1778) **\$39**

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RallySport Challenge delivers a unique racing experience by combining four different types of Rally into one game: Hill climb, "conventional" Rally, RallyCross, and Ice Racing. This variety of race types allows for gamers to experience traditional rally racing against the clock, as well as fierce, wheel-to-wheel grudge matches. RallySport Challenge delivers on what is truly fun about Rally games by focusing on the variety of on-track experiences that repeatedly challenge the gamer.

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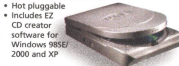


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With the USB Phono Preamp - its sound quality being highly superior to many amplifiers - you can create lossless copies of LPs on your PC.

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- Music without crackle or hiss
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Music Editing and CD-R Software!

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Websearch Code 192623	\$149
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Steinberg Instant CD/DVD 6.5

CD & DVD Recording software!

Burn Video, SuperVideo and Photo CDs in professional quality for your home DVD player - or make copies of your CDs and DVDs. Just drag and drop files and burn them as Audio, Video and Data CD/DVDs. Save important data with the Backup function - automatically, if you want.

Instant CD/DVD is the professional CD/DVD recording suite.



Websearch Code 192613	\$165
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Pioneer DVR-A05 DVD-R & DVD-RW

Features:

- 4X for DVD-R
- 2X for DVD-RW
- 16X for CD-R
- 8X for CD-RW

Internationally recognized reliability and compatibility

The DVR-A05 writes and reads DVD-R/RW, write once/recordable formats that can be played on most DVD video players and DVD-ROM drives. The drive also supports reading and writing of CD-R and CD-RW media, and can be used as a DVD-ROM and CD-ROM drive as well.

Liquid crystal tilt technology

Previous models used a mechanical tilt mechanism. The DVR-A05 features a liquid crystal tilt mechanism that provides more accurate, reliable operation with discs having uneven curvature or thickness. This superior mechanism is used for both playback and recording.



Pioneer

RENTAL
\$7.51
PER WEEK
Websearch Code 192615

\$685

Pioneer DVD-R x2 media

1 x 4.7GB DVD-RW
(for 1X/2X re-recording)



\$15

Websearch Code 192616

Pioneer 16xDVD-ROM Internal Drive

Features:

- DVD-1065 Slot-in Disc mechanism
- High speed average access time: DVD-ROM: 95ms
- High speed average seek time: DVD-ROM 85ms
- ATA/PI (ATA/ATAPI-5, Ultra DMA66)
- Digital Audio Output

Includes:

- PowerDVD XP, 2 year warranty & 40X for CD-ROM



\$125

Websearch Code 189947

Pioneer DCR-111KIT Combo Kit

Features:

- Write Speed: CD-R 12X CLV
- Write Speed: CD-RW 10X CLV
- Read Speed: DVD-ROM 12X CLV
- Read Speed: CD-ROM 40X CLV
- ATA/PI Interface
- Buffer Under run protection
- Low Vibration mechanism by DRA (Dynamic Resonance Absorber)

Includes:

- RecordNow/DLA writing software & PowerDVD XP



\$259

Websearch Code 192074

Pioneer DVD-R x4 5 Pack media

1 x 4.7GB DVD-R
(for 1X/2X/4X recording)



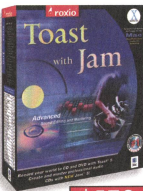
\$49

Websearch Code 192609

Roxio Toast with Jam

Work with Jam delivers the full CD and DVD burning power of Toast plus pro audio CD editing and mastering for Mac. Record your world to CD or DVD - your audio, video, photos and data. Produce commercial CDs and demos with impeccable quality. Import your favorite file formats like AIFF, WAV, MP3 or SoundDesigner II; edit in real-time using multiple plug-ins with included Bias Peak LEV5T, personalize and arrange your tracks with crossfades, trims and index points, then burn your master CD in the background while you do other work. Built for Mac OS X.

- Just drag and drop popular file formats like AIFF, WAV, MP3 and SoundDesigner II files.
- Jam also processes SoundDesigner II regions.
- New native support for up to 24-bit audio.
- Take advantage of smart dithering, for crystal clear conversion to CD. Toast with Jam includes award-winning Peak LE V5T sound editing software from BIAS.
- Edit your audio in real time, without expensive hardware.
- Adjust tone, enhance vocals with concert reverb, soften dynamic peaks, and create other special effects with included VST plug-ins!
- Intuitively and enjoyably create DJ-quality crossfades between tracks using a flexible waveform interface.
- Send your Jam project automatically to Toast 5 Titanium, and burn cleanly in the background while you use your MAC for other tasks.

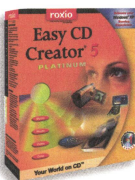


\$459

Websearch Code 190313

Roxio Easy CD Creator 5 Platinum

Access music on the Internet. Fine tune your music tracks. Edit and enhance photos and videos with a pro's touch. Includes: CD with Sound Stream 2, DirectCD, Spin Doctor, CD Copier, Video Impression, Photo Album, Video Postcard, VideoCD Creator, CD Label Creator, Sound Editor, Session Selector, Web CheckUp.

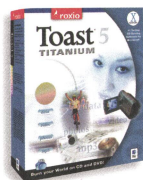


\$109

Websearch Code EASYCD

Roxio Toast 5 Titanium For Mac

Creates music, data & video CDs. Toast includes: CD-ROM with CD Spin Doctor, Panic Auditor, iView Media, Magic Mouse Discus, Toast Audio Extractor, Roxio Bonus CD with MP3 songs, video clips and 4 short films. User Guide, cable to connect a computer to a stereo system's Lineout.



\$169

Websearch Code ATOST

Pioneer DVD-R x4 media

1 x 4.7GB DVD-R white printable (for 1X/2X/4X recording)



\$12.75

Websearch Code 192618

Iomega Zip 250MB USB Host Powered

The Zip 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. Powered by a USB cable, it's easy to connect and easy to launch.



100MB USB
\$169

Websearch Code.....J0M151

250MB USB
\$289

Websearch Code.....111061

Iomega Zip 750MB USB2 External Drive

The Iomega Zip 750MB drive and disk is the fast and durable portable storage solution to back up your important data. Iomega Automatic Backup software makes backup a snap, and Iomega Sync software helps transfer files between computers. Zip 750MB drives and disks are the smart data storage choice. WinMac.



\$399

Websearch Code.....132639

Iomega CD-RW Predator 24x10x40x

External USB 2.0 CD-RW drive boasts higher speeds due to higher throughput of USB 2.0. This drive is also compatible with USB 1.1, which limits the drive speeds to 4x4x6. Includes all the hardware and industry leading software needed to easily and very quickly burn CDs.



\$439

Websearch Code.....180323

HP LTO Tape 100/200Gb

HP Ultrium data cartridges are designed to take full advantage of Ultrium technology and contain features that are exclusive to HP. HP Ultrium data cartridges feature active internal head cleaning, self-diagnostic capacities, cartridge memory and are designed for long life and superior reliability.



Websearch Code.....192717 **\$175**

Imation 4mm Tape Media

Imation 4mm DDS Data Cartridges give you data grade cartridges with protective backcoating. The cartridges are compatible with DDS 1-4 drives, and offer up to 20GB native capacity. Backup, restore, archive, copy, distribute, or manage your data with ease with Imation 4mm DDS Data Cartridges.



DDS-3 125M **\$22.50** DDS-4 150M **\$38**

Websearch Code.....192766 Websearch Code.....192767

Imation DVD-R Media

Some things you create deserve to be preserved for all time, like a wedding video, or a great new software program. Choose Imation DVD-R to ensure your creative masterpieces won't be altered or erased. DVD-R, a write-once format, is capable of producing pre-mastering discs and is ideal for high volume data recording, archiving and playback.



Websearch Code.....192770 **\$9.90**

Imation DVD+RW

Imation DVD+RW discs—the complete solution for your recording and storage needs. You can store up to 4.7Gb worth of data and video content for PC and entertainment applications. This equals more than two hours of high quality MPEG2 DVD video or a combination of both digital video and digital audio files, all on the same disc.



Websearch Code.....192772 **\$19.90**

HP 4mm Tape Media

DDS data cartridges are perfect for IT managers of mid-range servers (2-40 GB) using HP Surestore DAT drives or other manufacturers DDS drives.



DDS-3 125M **\$23.50** DDS-4 150M **\$52**

Websearch Code.....13038 Websearch Code.....192764

Imation DLT IV Tape Media

Imation Black Watch DLTape IV Cartridges offer enhanced features to ensure superior performance. Produced by Imation, Black Watch DLTape IV Cartridges are the latest high-quality data storage tape product from Imation's more than 50 years in storage media manufacturing.



Websearch Code.....192707 **\$107.80**

Imation CD-R Media 80min 700mb 40x

With Imation CD-R media, anything is possible. The media for storing or sharing music with your friends or storing combinations of data—photos, multimedia presentations, business applications, and more.



Websearch Code.....192769 **\$1.05**

Iomega Zip Disks

Iomega Zip disks now come in 100mb, 250mb and 750mb. A great way to store your files! Call for pricing on 250mb and 750mb disks.



100mb PC **\$18.90** 100mb MAC **\$18.90**

Websearch Code.....J70M55 Websearch Code.....J28C3

HP DLT IV Tape Media

HP DLT Data Cartridges hold up to 80 GB (compressed) of data and allow users to store and restore data with confidence.



Websearch Code.....192765 **\$105.60**

Imation LTO Tape 100/200Gb

Imation's Black Watch Ultrium Tape Cartridges, with up to 200GB storage capacity (2:1 compression) have been designed to surpass the required standards. Our patented corner snap, precise servo writing and overall design excellence have made Imation's LTO Ultrium cartridge the preferred choice for network data storage.



Websearch Code.....192768 **\$185**

Imation CD-RW

The CD-RW media is perfect for a wide variety of storage applications. With speeds ranging from 1x - 10x, this highly reliable media can record and rewrite up to 1,000 times and can be read indefinitely.



Websearch Code.....192771 **\$1.99**

Imation Super Disks

Imation SuperDisk Diskettes are the same size and shape as regular diskettes, but hold up to 240MB of data. That's the equivalent of 166 regular floppy diskettes! Use them to store, transfer, backup and archive graphics, games, multimedia and other files.



120mb 3 Pack **\$60** 240mb **\$21**

Websearch Code.....129561 Websearch Code.....192773



AF Phone Cleaners

Bactericidal wipes available in tub, flatpack and pre saturated sachets for cleaning and sanitising telephones and mobile phones.

- Contains strong bactericide
- Quick and easy to use



100x Sachets
Websearch Code 192750 **\$35.50**

25 Wipes
Websearch Code 192749 **\$5.95**

AF Inkjet Printer Cleaning Kit

Complete kit to keep inkjet printers and inkjet fax machines in optimum condition.

- Roller fluid cleans and restores grip of rubber rollers
- Cleaning fluid cleans copper contacts to restore print quality
- Inkjets cleaned with cleaning fluid and foam tipped spatulas
- Powerful case cleaner
- Ideal for use on printers with non-permanent printheads



Websearch Code 192747 **\$28.50**

AF Airdusters

Pure compressed gas for blowing dust and debris from inaccessible areas of computer and office equipment.

- 100% ozone friendly
- Non-flammable
- Actuator allows strength of blast to be controlled
- Ideal for use on keyboards, printers, fax machines and computers



Sprayduster 125ML (invertable)
Websearch Code 192739 **\$12.50**

Sprayduster 200ML (invertable)
Websearch Code 192740 **\$15.95**

Sprayduster 400ML
Websearch Code 192741 **\$22.50**

AF Isopropyl Alcohol

Isopropanol for technical cleaning used by technicians.

- 99.7% pure Isopropanol
- Leaves no residue
- Ideal for cleaning magnetic read/write heads, edge connectors when reseating PC boards, etc.
- Use pump spray with SafeWipes, FoamBuds or SafeBuds



Websearch Code 192737 **\$9.95**

AF Screen Cleaners

Wet/dry or moist anti-static cleaning wipes for monitors, laptops and anti-glare filters.

- Non-smearing
- Non-flammable, alcohol free
- Safe to use on all coated glass (including TFT and LCD) and polarising filters
- Also safe to use on mirrors, lenses, OHPs, microfilm & microfiche readers.



20x Wet/Dry wipes
Websearch Code 192751 **\$5.95**

100 Wipes in tub
Websearch Code 192752 **\$9.95**

AF Printer Rubber Roller Restorer

Non-toxic solvent pump spray for cleaning and restoring grip of all types of rubber rollers.

- Restores grip of printer and fax rollers
- Restores rubber roller flexibility
- Leaves no residue
- Dissolves ink stains, oil and grease
- Reduces paper jams
- Use with SafeCloths, SafeWipes, SafeTiss or PC Buds



Websearch Code 192746 **\$7.50**

AF CD Cleaning Kit

Disc fitted with micro brushes for cleaning lenses of CD-ROM, CD-R, CD-RW, games console and audio CD drives.

- Automatic 5 second cleaning cycle
- Voice instructions for multimedia and audio systems
- Inserted into CD drive as a normal CD
- Removes dust and debris from optical lenses
- Safe to use on all CD-ROM, CD-R, CD-RW and audio CD drives



Websearch Code 192738 **\$24.95**

AF Keyboard Cleaner

Wet/dry anti-bacterial sachet wipes for cleaning keyboards, computer casings and cables.

- Very powerful anti-bacterial cleaner
- Special cleaning cards assist cleaning between keys
- Sachets packed 295 x 305mm lint-free cloths
- Absorbent dry wipe to provide final polish



Websearch Code 192742 **\$12.95**

AF General Surface Cleaners

General purpose pre-saturated cleaning wipes in various dispensers.

- Non-flammable, alcohol free
- Safe to use on monitors, cases and keyboards
- Environmentally friendly tub refill available
- Remains moist over extended periods of time
- Anti-static properties reduce build up of dust & dirt



100 Wipes in tub
Websearch Code 192753 **\$9.95**

25 Wipes
Websearch Code 192754 **\$5.95**

AF Laser Printer & Plain Paper Fax Cleaning Sheets

Specialty coated paper for cleaning plain paper fax machines and laser printers.

- Removes toner and dirt from paper paths and optics
- Used dry, no solvent is required
- Can be re-used up to 5 times
- Also available in Laser Printer & Fax Cleaning Kit



Websearch Code 192743 **\$17.95**

AF CD Scratch Repair & Cleaning Kit

Kit with solvent pump spray, restorer polish and cleaning cloths for removing grease and dirt from CD-ROMs, CD-Rs, CD-RWs and audio CDs.

- Safe to use on CD-ROMs, CD-Rs, CD-RWs and audio CDs
- The special CD polish will remove minor scratches that cause reading errors
- Use the cleaning fluid to remove fingerprints, dust and dirt
- Ultra-pure absorbent cotton cloths to dry off excess fluid



Websearch Code 192745 **\$19.50**

AF Tonerclene & Lint-Free Tissues

- Tonerclene: Impregnated cloths for wiping up toner spills safely
- Lint-Free Tissues: High quality lint free single ply paper wipes ideal for screens and filters



Tonerclene 25 Cloths
Websearch Code 192744 **\$21.50**

SafeTiss 200x Lint-Free Tissues
Websearch Code 192743 **\$9.95**

Juzt Reboot

Juzt Reboot Intelligent back-up technology! Instant Recovery! Corruption by known and unknown viruses Software installation corruption File deletion by applications Unwanted alterations Hard disk formatting No matter how your System/Data is destroyed; either by virus attacks, deletion, formatting, overwrites, fdisk, modification or improper shutdowns, Juzt Reboot and your system will recover instantly. No other additional system/data recovery operations are required.

The Juzt Reboot Recovery Card can support hard disks of any size and capacity. This is a useful feature especially when you wish to upgrade your system.



\$149
Websearch Code 191590

Crumpler - Wack-O-Phone Laptop bag

Original 1000 D Cordura Nylon, Heavy Duty Padding; Internal and External Zip Pockets; Padded Shoulder Strap; Escape Hole for audio or communication devices; Quick release Buckles and Laptop Stabilizer.

Internal Dimensions: 47x33x16cm and holds up to a 14.1 screen



Wack-O-Man (Olive)
\$175
Websearch Code 191486

Wack-O-Man (Navy)
\$175
Websearch Code 191479

Very Busy Man (Olive)
\$199
Websearch Code 191487

Very Busy Man (Red)
\$199
Websearch Code 191481

HP InkJet Papers

To save time and effort and to get the best results, you need the right media for the job and your printer. HP has made an extraordinary investment in developing a wide selection of papers and film that work flawlessly with HP Printers and inks to deliver results that are always clear and sharp.



A4 Premium Paper Pack 200
\$36.30
 Websearch Code 182820

Canon Coated Inkjet Papers

Canon inkjet papers are especially designed to enhance the images that you produce on your Canon Bubblejet printer. You can be sure that by using Canon inkjet papers that your images will be crisp, clear and lasting on each print. You can on a Canon!



Glossy Photo A4, 20 Pack
\$19.25
 Websearch Code 192789

Paper High Res A4, 50 Pack
\$13.75
 Websearch Code 192789



HP DeskJet Cartridges

Each HP inkjet print cartridge consists of an integrated printhead and ink supply; designed for easy snap-out/drop-in for clean, fast replacement. The result is a new printhead and fresh ink every time the print cartridge is exchanged for maximum print quality and reliability.

Websearch 190196	HP Inkjet Cartridge No 45 Black - 51645AA	\$59.95
Websearch 123995	HP Inkjet Cartridge No 41 Colour - 51641AA	\$61.00
Websearch HP0008	HP Inkjet Cartridge No 29 Black - 51629AA	\$59.95
Websearch HP0007	HP Inkjet Cartridge No 49 Colour - 51649AA	\$61.00
Websearch 192529	HP Inkjet Cartridge No 15 Black - C6615DA	\$56.50
Websearch 130079	HP Inkjet Cartridge No 23 Colour - C1823DA	\$65.90



HP Mono LaserJet Cartridges

HP LaserJet print cartridges have been designed to work together with your HP LaserJet printer. You will always get clear, sharp text and graphics for high-impact results.

Websearch AUC125	HP LaserJet 516L Series Toner - C3906A	\$117.00
Websearch HWP001	HP LaserJet 1100 Series 2,500 Page Toner - C4092A	\$115.00
Websearch 192755	HP LaserJet 1200 Series 3,500 Page Toner - C7115X	\$149.00
Websearch HWP002	HP LaserJet 2100 Series 5,000 Page Toner - C4096A	\$195.00
Websearch 129465	HP LaserJet 4/5 Series 6,800 Page Toner - 92298A	\$179.00
Websearch 192571	HP LaserJet 4000 Series 10,000 Page Toner - C4127X	\$245.00
Websearch 192673	HP LaserJet 4100 Series 10,000 Page Toner - C8061X	\$245.00



HP Colour LaserJet Cartridges

HP LaserJet print cartridges have been designed to work together with your HP LaserJet printer. You will always get clear, sharp text and graphics for high-impact results.

Websearch 192756	HP Colour LaserJet 4500 Toner Black - C4191A	\$169.00
Websearch 192758	HP Colour LaserJet 4500 Toner Cyan - C4192A	\$245.00
Websearch 192757	HP Colour LaserJet 4500 Toner Magenta - C4193A	\$245.00
Websearch 192759	HP Colour LaserJet 4500 Toner Yellow - C4194A	\$245.00
Websearch 192760	HP Colour LaserJet 4600 Toner Black - C9720A	\$299.00
Websearch 192761	HP Colour LaserJet 4600 Toner Cyan - C9721A	\$399.00
Websearch 192762	HP Colour LaserJet 4600 Toner Magenta - C9722A	\$399.00
Websearch 192763	HP Colour LaserJet 4600 Toner Yellow - C9723A	\$399.00

Canon BubbleJet Cartridges

Use only genuine Canon Bubblejet ink cartridges for your Canon Bubblejet printer to ensure high quality images and text from the first print to the last. Canon Bubblejet cartridges are designed to give you maximum output with your Bubblejet printer and ensure customer satisfaction on every page.

Websearch 189408	Canon Inkjet Cartridge BC02 Black	\$40.00
Websearch CAN236	Canon Inkjet Cartridge BC03 Black	\$38.00
Websearch CAN064	Canon Inkjet Cartridge BC05 Colour	\$49.00
Websearch CAN072	Canon Inkjet Cartridge BC1-21BK Black	\$11.70
Websearch CAN071	Canon Inkjet Cartridge BC1-21C Colour	\$29.00
Websearch CAN024	Canon Inkjet Cartridge BC20 Black	\$54.50
Websearch CAN086	Canon Inkjet Cartridge BC1-10BK Black	\$24.90
Websearch CAN084	Canon Inkjet Cartridge BC1-11C Colour	\$31.50
Websearch CAN015	Canon Inkjet Cartridge BC21E Colour	\$78.00



Epson InkJet Cartridges

Features quick-drying, acid-free ink with superior resistance to bleeding and smudging on all media types.

Websearch 130914	Epson Inkjet Cartridge Black - C13T028091	\$49.00
Websearch 189243	Epson Inkjet Cartridge Colour - C13T029091	\$46.50
Websearch EP5448	Epson Inkjet Cartridge Black - C13T013091	\$27.00
Websearch EP5011	Epson Inkjet Cartridge Colour - C13T014091	\$37.50
Websearch EP5344	Epson Inkjet Cartridge Black - C13502018790	\$34.50
Websearch EP5333	Epson Inkjet Cartridge Black - C13502018990	\$39.50
Websearch EP5335	Epson Inkjet Cartridge Colour - C13502019190	\$43.50
Websearch EP5012	Epson Inkjet Cartridge Colour - C13502019390	\$31.50

We carry a full range of supplies.
Please call 1300 300 003 if your supplies are not listed above.



Brother Fax-645 Plain Paper Fax

10 page automatic document feeder 30 sheet cassette tray 512KB memory stores up to 20 pages for Broadcasting. Out-of-paper reception and QuickScan Multi-copying with sorting up to 99 copies plus enlargement and reduction.



\$275

Websearch Code 192719

Brother Laser Fax-2850

This affordable plain paper Laser Fax with 2MB memory stores up to 90 pages for out-of-paper reception and supports fax broadcasting to multiple locations. With Dual Access, QuickScan capability and a 14.4K bps modem, the FAX-2850 delivers laser performance and reliability. Automatic Fax/Telephone switching lets you receive both fax and voice calls on a single phone line.



\$725

Websearch Code 192720

Brother MFC-3100C

The MFC-3100C is an All-in-One colour fax, colour printer, colour copier, colour scanner and PC Fax. It delivers fast inkjet printing at up to 100ppm black and 80ppm colour. Enjoy this high quality 2400 x 1200 dpi printing for exceptional photo quality output.



\$495

Websearch Code 192721

Brother MFC-9180

The MFC-9180 is a 5-in-1 flatbed laser multi-function center combine performance, connectivity, and reliability. This full-feature fax, laser printer, and convenience copier enables you to copy objects such as books and magazines with both reduction and enlargement.



\$1195

Websearch Code 192722

Brother HL-1440 Laser Printer

In today's fast moving business environment the ability to print to a professional finish quickly and efficiently is essential. With a high quality 1200 x 600 dpi resolution combined with a print speed of 14 pages per minute, the Brother HL-1440 mono printer meets this challenge comfortably.



\$499

Websearch Code 192723

Brother HL-1870N Laser Printer

The Brother HL-1870N printer is designed to meet your professional printing requirements and combines total quality with performance and reliability. As well as outstanding quality, various economical features of the HL-1870N printer means real cost benefits are provided along with a professional finish to all your documents.



\$1395

Websearch Code 192724

Brother HL-2600CN Colour Laser Printer

The HL-2600CN delivers the perfect balance of quality workgroup colour printing with economical purchase and operating costs. Outstanding colour output: true 600x600dpi colour printing with exceptionally crisp, high-resolution text and graphics driven by Brother's exclusive printing enhancement technologies.



\$4180

Websearch Code 192818

Brother Fax-1020 Plus

- 14,400 bps high speed fax modem
- Transmission speed: Up to 9 sec
- 20 page automatic document feeder
- 200 sheet cassette tray
- 512KB memory stores up to 20 pages for Broadcasting, out of paper reception and Super quick scan.



\$449

Websearch Code 192817

Brother MFC-9160

The MFC-9160 is an up to 10 copy per minute digital copier that delivers high quality output. The copier includes a 30 page ADF, and a 200 sheet capacity paper tray. Coupled with uncompromising, up to 10 page per minute laser printing at 600 x 600 dpi, the MFC-9160 is the right choice at the right price. Also included, is a built-in 9600 x 9600 dpi interpolated resolution flatbed color scanner.



\$949

Websearch Code 192819

Brother Fax and Laser Supplies

192725	Brother Laser Toner TN-300	\$43.50
192726	Brother Laser Toner TN-6600	\$115.00
192727	Brother Laser Toner TN-7600	\$125.00
192728	Brother Laser Toner TN-8000	\$43.50
192729	Brother Laser Toner TN-9000	\$249.00
192730	Brother Ink Cartridge LC-21BK Black	\$30.00
192731	Brother Ink Cartridge LC-21C Cyan	\$17.50
192732	Brother Ink Cartridge LC-21M Magenta	\$17.50
192733	Brother Ink Cartridge LC-21Y Yellow	\$17.50
192734	Brother Fax Cartridge PC-201	\$37.50
192735	Brother Fax Cartridge PC-301	\$28.50
192736	Brother Fax Cartridge PC-401	\$26.50



**HL-1440
SPECIAL
\$499**

brother

Jazz 2 Piece Computer Speakers (11161)

- 2.4 Watts RMS
- 2.5" Full Range Drivers
- 8 Ohms Impedance
- 150Hz to 18,000Hz Frequency Response
- Power, LED, Volume Controls/Features
- 3.5mm Stereo Input

For the Jazz speaker range visit www.iswh.com.au/jazz



\$19.95

Websearch Code 191440

Jazz Game Beast Speakers with Built-In Subwoofer (J6906)

- 20 Watts RMS
- 3" Woofer & 2.5" Full Range Drivers
- 80Hz to 20,000Hz Frequency Response
- 4 Ohms Impedance
- Volume, Power, Bass Controls
- Left & Right Speaker Outputs
- Dual Headphones Jacks
- Magnetically Shielded

For the Jazz speaker range visit www.iswh.com.au/jazz



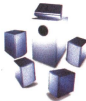
\$108

Websearch Code 191443

Jazz 5.1 Home Theater Speakers

- 2 Way Center (J9003A)
- 150 Watts RMS (Subwoofer - 50 Watts; Satellite - 20 Watts Each)
- Drivers: Subwoofer - 6.5" Woofer; Satellite - 3" Full Range; Center - 3" Full Range, 1.5"
- 40Hz to 20KHz Frequency Response
- Inputs: Speaker Wire in
- Magnetically Shielded

For the Jazz speaker range visit www.iswh.com.au/jazz



\$175

Websearch Code 191446

hp c812 photosmart

- 4.13 Mega-Pixel
- 3 x Optical Zoom, 7x Digital Zoom
- HP Instant Share software
- 60 sec video recording
- 16MB SD card
- Easily print photos directly from your camera to HP Photosmart printers and Deskjet printers with USB connectivity - no PC required
- Docking station included



NEW

\$12.70 PER WEEK
\$1159
Websearch Code 190480

hp photosmart c320

- 2.1 MP total resolution and 4x digital zoom
- Send photos automatically to up to 14 destinations with HP Instant Share technology
- Built-in video function in the camera, take great pictures and send them to print directly to an HP printer without using a PC with the direct digital printing feature



NEW

\$469
Websearch Code 191422

hp c120 photosmart

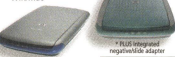
- 1 Mega-Pixel
- 2x digital zoom
- Recording time can be increased with CF card
- 4MB internal memory
- 1.4" colour LCD
- Ability to take video
- Comes with non-rechargeable AA batteries (can use rechargeable batteries and optional ac adapter)



\$269
Websearch Code 190121

hp scanjet 3500 & 3570

- 1200 x 1200 dpi
- 48 bit colour
- Dual CCD
- hp photo and imaging software - with hp memories disc creator software
- Quick buttons - scan, copy and email
- USB 2.0 Full Speed
- Win/Mac



* PLUS integrated negative/white adapter

\$239
Websearch Code 190504

\$315
Websearch Code 190504

hp deskjet 3325

- 1200 x 600 dpi
- 8 ppm black, 6 ppm colour
- hp PhotoREt 3 colour layering technology
- USB 2.0 Full Speed
- Win/Mac



\$115
Websearch Code 192058

hp deskjet 5550

- 4800 x 1200 dpi
- 17 ppm black, 12 ppm colour
- hp PhotoREt 4 colour layering technology
- Borderless 4"x6" photo printing
- USB 2.0 Full Speed
- Win/Mac



\$275
Websearch Code 191370

hp psc 750

- The hp PSC 750 is a versatile, flatbed printer, scanner and copier all-in-one. Create colour brochures, make copies of price lists, and scan photos to use in your promotional literature - all using one compact unit, right at your desktop.



\$359
Websearch Code HWP418

hp Scanjet 4500

- 2400 dpi
- 48 bit colour
- Easily scan thick books for clear and sharp results
- Scan 3D objects for true-to-life results
- USB 2.0 Full Speed
- Win/Mac



\$429
Websearch Code 191416

hp deskjet 3420

- 2400x1200 dpi
- 10ppm black, 8ppm colour
- hp PhotoREt 3 colour laser technology
- Easy to set up and use
- On screen ink level indicator and print cancel button
- USB 2.0 Full Speed
- Win/Mac



\$144
Websearch Code 190709

hp Photosmart 7150

- 4800 x 1200 dpi
- 14 ppm black, 10 ppm colour
- hp PhotoREt 4 colour layering technology
- Print in seconds with direct printing from your hp digital camera via front access USB port
- Borderless 4" x 6" photo printing
- USB 2.0 Full Speed
- Win/Mac



\$319
Websearch Code 191521

hp officejet v40

- Print, fax, scan and copy seamlessly with integrated software "photo-fit-to-page" button enables you to enlarge a photo with a single touch. Fax and copy at the press of a button without being connected to a PC. Quick setup instructions and intuitive control panel. USB connectivity for PC.



\$465
Websearch Code 189460

hp Scanjet 7450C

- 2400 dpi
- 48 bit colour
- Dual CCD
- Large scanning surface lets you scan up to legal size
- Scan up to 15ppm with 50pp capacity
- USB 2.0 Full Speed
- Win/Mac



\$1465
Websearch Code HP9505

hp deskjet 3820

- 4800 x 1200 dpi
- 12 ppm black, 10 ppm colour
- hp PhotoREt 3 colour layering technology
- One-touch print cancel button and low-ink indicator light
- USB 2.0 Full Speed
- Win/Mac



\$189
Websearch Code 190710

hp deskjet 1220c - A3 Printing!

- 2400 x 1200dpi
- 11 ppm black, 9.5 ppm colour
- Prints any size from postcards (A6) to posters (A3+) on a variety of media
- hp PhotoREt 3 colour layering technology
- USB 2.0 Full Speed
- Win/Mac



\$589
Websearch Code HWP436

HP LaserJet 1200 Series

- All models have:
- 1200 x 1200dpi
- 15ppm
- hp PCL 5e
- 250 sheet tray
- Parallel / USB interface
- Win/Mac



\$785
Websearch Code HWP501

\$1289
Websearch Code HWP502

1200N - hp Jet Direct Network Card, optional scanner copier adaptor, 16mb sdt, 10100 Base-T



Canon N640p scanner

- 600 x 1200 dpi
- Distortion free scanning using LIDE Technology
- Includes ArcSoft PhotoStudio and ScanSoft OmniPage software
- Parallel Port connection
- Win

NEW



\$125

Websearch Code : CAN310

Canon D1250U2F scanner

- 1200 x 2400 dpi
- 48bit colour
- Scan directly from 35 mm film and multiple photos at once
- USB 2.0 full speed
- Win

NEGATIVE FILM SCANNER!



\$299

Websearch Code : 189975

Canon D2400 scanner

- 2400 x 4800 dpi
- 48bit colour
- Built-in film scanner for 35mm, 120 format and 4 X 5" format
- One touch software controls
- Wide aperture lens
- USB 2.0 full speed
- Win / Mac

NEW



\$529

Websearch Code : 111119

Canon s100sp printer

- 720x360 dpi
- 5ppm
- Cost saving separate black and tri-colour ink
- Banner and poster printing
- USB 2.0 full speed
- Win/Mac



\$99

Websearch Code : 189927

Canon s300 printer

- 1200 x 2400dpi
- 11 ppm black, 7.5ppm
- High speed mode reduces ink consumption
- USB 2.0 full speed
- Win/Mac



\$215

Websearch Code : 189922

Canon S520 printer

- 1200 x 2400dpi
- 14 ppm black, 9ppm colour
- Create prints without borders up to A4 size
- 4 individual ink tanks to save money
- USB 2.0 full speed
- Win/Mac



\$355

Websearch Code : 189928

Canon s750 printer

- 1200 x 2400dpi
- 20 ppm black
- Create full-bleed A4 photos
- Includes Zoom Browser, Photo Stitch, Photo Record and 3D Photo Print software suite.
- USB 2.0 full speed
- Win/Mac



\$415

Websearch Code : 189900

Canon s820 printer

- 2400 x 1200 dpi
- 4 ppm black
- Create full-bleed A4 photos
- 6 ink photo system and Advanced MicroFINE Droplet Technology means unbeatable quality in no time.
- USB 2.0 full speed
- Win/Mac



\$589

Websearch Code : 189921

Canon s6300 printer

- 2400 x 1200 dpi
- 17 ppm black, 11ppm colour
- Create 4" x 6" to A3 photos
- USB 2.0 full speed
- Win/Mac

A3 PRINTER!



\$815

Websearch Code : 189902

Canon BJC 85 Portable

- 720 x 360 dpi
- Becomes a 360 dpi colour scanner with optional IS-12 Colour Image Scanner
- New AD360U international power adapter included
- Cordless printing with built-in, fast IRDA
- Up to 5 ppm in monochrome
- Up to 2 ppm in colour
- Optional 4-colour PhotoRealism printing
- Multi interface
- Win/Mac



\$379

Websearch Code : CAN287

Canon ImageCLASS MPC 600F

- 2400 x 1200 dpi printing
- 17ppm black, 12 ppm colour
- 3 secs per page fax transmission
- Flatbed scanning with 30 Sheet Automatic Document Feeder
- Electronic sorting of copies
- USB 2.0 full speed and parallel
- Win



\$949

Websearch Code : 190660

Canon ImageCLASS D680

- 2400 x 600 dpi printing
- 12ppm black
- Huge fax memory of 79 pages
- Flatbed scanning with 30 Sheet Automatic Document Feeder
- Electronic sorting of copies
- USB 2.0 full speed and parallel
- Win



\$1399

Websearch Code : 190661

Canon PowerShot S40

- 4 Megapixel
- 3x aspherical zoom lens – equivalent to 35-105mm
- Complete range of creative exposure control modes
- RGB colour filter and adaptive signal processing
- USB 2.0 full speed
- Win/Mac



\$1229

RENTAL \$13.47 PER WEEK

Websearch Code : 190431

Canon PowerShot A40

- 2 Megapixel
- 3x optical zoom lens, 7.5x with digital zoom – 35-105mm
- Movie recording and playback with audio
- 3-Point Advanced Intelligent Auto Focus (IAAF) and single-point AF selection
- USB 2.0 full speed
- Win/Mac



\$609

RENTAL \$6.68 PER WEEK

Websearch Code : 105294

Canon PowerShot A200

- 2 Megapixel
- Auto-focus
- Simple and convenient operation – easy image transfer, photo printing, PC/LCD display
- Up to 30 seconds movie recording
- USB 2.0 full speed
- Win/Mac



\$369

Websearch Code : 190479



Nexdisk USB

Storage Drive

Perfect Compatibility with USB Interface 1.1. USB 1.1 is included in any Pentium PC. Use NEXDISK without any other cards or devices in these computers.



64MB
\$115

Websearch Code 190378

128MB
\$199

Websearch Code 190377

256MB
\$299

Websearch Code 192183

Flash USB

Storage Drive

Save your important data on a flash usb drive! USB port allows the fastest data transfer. You don't need a separate power device or cable. Just plug it into the usb port of your computer.



64MB
\$115

Websearch Code 189715

128MB
\$199

Websearch Code 189716

256MB
\$339

Websearch Code 189717

Wincan MobileDrive

3-in-1 USB Flash Hard Drive

The MobileDrive plus SD/MMC is a removable flash disk drive with USB connector and a SD/MMC card connector, which allows you not only to store data, but also read the data on any SD/MMC card as well.



32MB
\$109

Websearch Code 191458

64MB
\$145

Websearch Code 191459

128MB
\$222

Websearch Code 191460

Belkin SurgeMaster

The Belkin 4 and 5 plug surge board (both with telephone/modem line protection) offers ultimate protection against power spikes or lightning. SurgeMaster offers a Maximum Spike Amperage of 27,000 Amps, \$25,000 Connected Equipment Warranty, and a Lifetime Product Warranty.

SurgeMaster with telephone line protection shown.



Surge Protector (5 Plug) Tel.
\$68

Websearch Code 189595

Surge Protector (4 Plug) Tel.
\$45

Websearch Code BEL175

Belkin USB 2.0 4-Port Hub

Connect to multiple devices with the USB 2.0 Hi-Speed 4-port hub. At speeds up to 480Mbps. All connectors are fully compatible with USB 1.0 and 1.1 equipment and no cable adapters are required.



USB 1.1 4 Port Hub
\$49

Websearch Code 189498

USB 2.0
\$95

Websearch Code 189456

Logitech Wheel Mouse

The Logitech Wheel Mouse has twice as much accuracy and speed as current optical sensor mouses on the market. The mouse can be used by either hand and comes with a five year warranty.



\$75

Websearch Code LOG114

Logitech Cordless Freedom iTouch

Enjoy complete control and reliable performance, without cords that catch or tangle. iTouch lets you access the internet, open e-mail, search, or launch applications with the touch of a key.



\$175

Websearch Code 130951

Belkin SurgeMaster II

8 surge-protected power sockets, 2 protected telephone/modem line sockets. Best protection for all your advanced computer equipment and sensitive electronic devices. SurgeMaster II offers a Maximum Spike Amperage of 39,000 Amps, \$80,000 Connected Equipment Warranty, and 4-metre heavy-duty power cord. Lifetime Product Warranty.



\$109

Websearch Code 190488

Belkin USB2 5 port Hi-Speed PCI Card

Belkin's Hi-Speed USB 2.0 card brings 480Mbps speed to USB connectivity. With a bandwidth 40 times greater than 1.1 it is the ideal interface for transferring large amounts of data from USB 2.0 compliant products. 4 external and 1 internal ports.



\$90

Websearch Code 190888

Belkin n50

The n50 SpeedPad is a combination keyboard and game pad. The 10 keys on the n50 act as keys on a keyboard, being easily accessible and intuitively configured. The n50 also has an eight-way directional pad. It's an innovative, multipurpose tool that will lift your gaming experience to a whole new level.



\$65

Websearch Code 189526

Belkin Optical Mini Scroller

The Mini Scroller Optical Mouse enables you to program the left button for frequently used commands. It uses an optical sensor that photographs surface patterns at 1500 frames per second. USB or PS2 compatible.



\$39

Websearch Code 189599

Logitech Cordless MouseMan Optical

Discover the outstanding cordless optical mouse for PC and Macintosh! There's no cord to limit your movement and it's optical so that you can use it on any surface. Logitech's patented digital radio technology works in a two-meter range of your computer.



\$129

Websearch Code 189324

Logitech Cordless Presenter

Take advantage of this powerful, cordless device for your presentations and also utilise as a cordless optical mouse. The built-in laser pointer allows you to emphasise you're key points and advanced Bluetooth technology gives you cordless reliability with up to 10 meter range; with no line of sight required.



\$375

Websearch Code 190307

Logitech Cordless Freedom Optical

The ultimate cordless keyboard and optical mouse provides less clutter, more style, and more freedom. The revolutionary cordless optical mouse runs on almost any surface.



\$214

Websearch Code LOG129

Logitech Quickcam Pro 3000 USB

Express yourself creatively with high quality pictures and videos. Utilising a CCD sensor, the QuickCam Pro 3000 takes stunning pictures and videos with a true 640x480 (VGA) resolution. Use its built in microphone to make live video calls over the Internet and send exciting e-mail with pictures and videos.



\$209

Websearch Code LOG115

DECEMBER/JANUARY 2002



iswh

International
Software
Warehouse

Connectivity

D-Link DWL-900AP+

AirPlus 22 Mbps Wireless LAN Access Point

Features:

- 10/100Mbps Fast Ethernet Interface for connecting to Wired Network
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Antennas & Adjusts Speed to conditions for Maximum Performance
- 64-/128-/256-Bit Wired Equivalent Privacy (WEP) Security Support
- Configuration & Management via Web Browser



22Mbps
Wireless

Websearch Code 190516

\$299

D-Link DWL-650+

AirPlus 22Mbps Wireless LAN PCMCIA Card

Features:

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Antennas & Adjusts Speed to conditions for Maximum Performance
- 64-/128-/256-Bit Wired Equivalent Privacy (WEP) Security Support
- Supports Peer-to-Peer Communication (No Access Point) or Infrastructure Mode (Access Point)



22Mbps
Wireless

Websearch Code 190515

\$145

D-Link DWL-6000AP

AirPro 2.4GHz/5GHz Multimode Wireless LAN Access Point

Features:

- Simultaneously connects to both 802.11a and 802.11b wireless networks.
- Latest dual-band technology in 2.4GHz and 5GHz
- Transfer rates of up to 72Mbps in the 5GHz frequency range and 22Mbps in the 2.4GHz frequency range



NEW

RENTALWARE \$10.07 PER WEEK

Websearch Code 190633

\$919

DWL-AB650

AirPro Multimode 2.4/5GHz Wireless LAN PCMCIA Adapter

Features:

- Compliant with IEEE 802.11a (5GHz) & IEEE 802.11b (2.4GHz) Standard
- 72Mbps Turbo Mode support for IEEE 802.11a
- 64 / 128 / 152-Bit Wired Equivalent Privacy (WEP) Security Support
- Supports Peer-to-Peer Communication (No Access Point) or Infrastructure Mode (Access Point)
- Drivers for Windows 98, 2000, ME & XP



NEW

Websearch Code 190694

\$449

D-Link DWL-AB520

AirPro Multimode 2.4/5GHz Wireless LAN PCI Adapter

Features:

- PCI adapter for desktop computers that can connect to both 802.11b and 802.11a wireless networks
- IEEE 802.11a and 802.11b compliant and interoperable with other 802.11a and 802.11b compliant devices
- High-gain external antenna
- Provides the option to utilize 152-bit WEP with dynamic keying along with 802.1x user authentication to secure 802.11 transmissions



NEW

Websearch Code 190570

\$365

D-Link DSL-300

Ethernet ADSL Modem

Features:

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45)
- ADSL Interface (RJ11)
- Supports G.dmt
- Telstra Approved



Websearch Code 190683

\$315

D-Link DSL-504

ADSL Router with 4-Port 10/100Mbps Switch

Features:

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 4-Port 10/100Mbps Switch
- ADSL Interface (RJ11)
- Supports G.dmt
- IP Routing with Transparent Bridge
- Supports NAT & DHCP
- Admin through Windows based program, Telnet or Web Browser
- Telstra Approved



Websearch Code 190696

\$419

D-Link DI-704P

IP Router for DSL/Cable Modem with Firewall

Ethernet Broadband Gateway with a built-in four port switch plus a print server function.

Features:

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Support NAT for Firewall Protection, Integrated Printer Server.



Upgrade to a 707P for just \$50 and get 3 extra switch ports

Websearch Code 190311

\$225

D-Link DI-804V

VPN Router for DSL/Cable Modems with 4-Port Switch

Features:

- 4-Port 10/100Mbps Switch
- RS232 Serial Port for backup Analog Modem
- Internal DMZ (Demilitarized Zone)
- LAN-to-LAN VPN Connection (8 Tunnels Supported)
- Static Packet Inspection (SPI)
- Network Address Translation (NAT) for single IP Address
- VPN protocols for PPTP & L2TP
- IPsec Security DES & 3 DES



NEW

Websearch Code 190513

\$365

D-Link DFL-500

Secure Firewall with Point-to-Point VPN

Features:

- 20 VPN Tunnels
- DMZ
- SPI
- IPsec Security DES & 3 DES
- Content Filtering & Virus Scanning
- VPN Protocol
- PPTP & L2TP
- Desktop Size



NEW

Websearch Code 190697

\$1049

D-Link DI-614+

AirPlus Enhanced 2.4GHz Wireless Router

Features:

- Capable of data transfer rates up to 22Mbps
- Creating your first wireless network
- Quickly and securely connect computers to share a high-speed Internet connection
- Connection of up to four computers
- Connect to the network using 64, 128, or 256-bit encryption
- Four port switch built in.



NEW

Websearch Code 190551

\$609

Adaptec USB 2.0 PCI Connect Kit

- 4-port (1 Internal) Host Bus Adaptor, Hot Pluggable Plug and Play Connectivity
- Supports up to 480 Mbps throughput, Up to 40x faster than USB 1.1
- Includes USB 2.0 Latest Drivers and USB 2.0 utilities available On-line.
- Supports: Win/Mac



\$99

Websearch Code Win/Mac 190914

Adaptec DuoConnect USB 2.0/1394 PCI combo card Kit

- 7-port Host Bus Adaptor, 4-port USB 2.0 and 3-port FireWire (1x USB Internal & 1x FireWire Internal).



\$189

Websearch Code 189839

Adaptec USB 2.0 Upgrade Kit

- Adaptec's USB 2.0 Upgrade Kit includes:
 - a USB 2.0 card
 - a USB 2.0 hub
 - Drivers, and USB control Utility.
- Supports: Win/Mac



\$159

Websearch Code 190492



www.iswh.com.au



click here to buy...

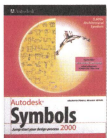
13

Computer aided design (Cad) Computer Products at Rock Bottom Prices

DECEMBER/JANUARY 2002

Symbols 2000 Architectural

A professional collection of more than 5,600 architectural symbols that let you complete detailed floor plans and construction documents dramatically faster. The package includes symbols for external layouts (bushes, trees, people), planning views, elevations and sections, electrical installation, building services/HVAC (plumbing, ventilation), kitchens, bathrooms, office furniture, network planning, pictograms for recreation, sports organization and planning.

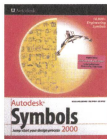


\$149

Websearch Code 130191

Symbols 2000 Engineering

A collection of more than 10,000 symbols in total, covering symbols for manufacturing and schematics drawings. The set includes more than 3,100 symbols for electrical schematics and installation plans complying with IEC standards with symbols for switching equipment, generation and conversion of energy, telecommunications and electrical installation.



\$149

Websearch Code 130331

AutoCAD LT 2002

Provides 100-percent DWG compatibility with AutoCAD 2002 based products. Open, edit, and exchange drawing files (DWGs) with complete confidence. A comprehensive Internet toolset streamlines collaboration between design team members - planning cycle times and reducing costs. Plus new enhancements like automated associative dimensioning.



***FREE CORDLESS OPTICAL MOUSE**

FREE Logitech Mouse with every purchase of full version of AutoCAD LT 2002

****\$100 CASHBACK**

Purchase AutoCAD LT 2002 Upgrade and receive \$100 cash back!

*Purchase AutoCAD LT 2002 (Full retail version only) and receive a FREE Logitech Cordless Optical Mouse (Value \$99.99). With redemption only with Scholastic New Media. Valid till 31st January 2003 or while stocks last. Conditions apply.
**Purchase AutoCAD LT 2002 Upgrade and receive \$100 cash back! Redeemable through Scholastic Australia. Refer to sticker on box. Applicable to commercial versions only. Valid till 31st January 2003. Conditions apply.

EDUCATION
PRICING
AVAILABLE

Full

\$1799

Websearch Code AUT482

Upgrade

\$625

Websearch Code AUT481

Volo View 2

Volo View 2 software is a cost-effective, easy-to-use digital design viewing solution that lets everyone on your team electronically review, mark up, measure, and plot AutoCAD and Autodesk Inventor based drawings.



UPGRADE
PRICING
AVAILABLE

Full

\$385

Websearch Code AUT488

AutoSketch 8

An affordable and easy-to-use precision drawing tool for new or occasional CAD users who need to create conceptual drawings and sketches. It provides productivity and ease of use features not found in other low cost precision drawing programs. From concept sketches, information graphics and floor layouts to presentations, electrical drawings and home project plans, you can draw it all - quickly and accurately.



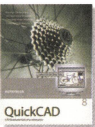
Full

\$229

Websearch Code 189550

QuickCAD 8

QuickCAD is the most affordable design program that Autodesk offers, but its low price doesn't diminish its capabilities. It comes with plenty of productivity features that let you make technical designs and diagrams. With its short learning curve, QuickCAD lets you start drawing right away by offering a simple beginner interface, then as you grow familiar with its capabilities, you can change to advanced or expert levels.



Full

\$135

Websearch Code 189551

Student Versions \$265

AutoCAD 2002



Autodesk Architectural Desktop 3.3



Autodesk VIZ 4



Autodesk Land Desktop 3



Autodesk Inventor Series 5

Includes:
AutoCAD 2002 & Autodesk Mechanical Desktop 6




MAUS Stockmarket Plus 5

Award Finalist in the Channel 9 small Business Show Software awards
One of the biggest selling personal investment software tools in Australia. The application is a 4 in 1 Investment Software Tool. It handles shares, options, warrants, property, managed funds, fixed interest and a range of other investments with ease! Can now be used in conjunction with online bank accounts.


\$185

Websearch Code 19148

MAUS Job Descriptions

Create clear, concise job descriptions in minutes. Choose from over 3,500 customisable job descriptions selectable by job title or industry. Use the question and answer format to address physical and educational requirements, work environment, qualifications and supervisory duties.


\$249

Websearch Code MAU005

MAUS Performance Review

- Save up to 90% of the time spent performing employee appraisals.
- Record day to day problems and accomplishments more efficiently.
- Includes Performance log: goals, critical incident reporting.
- Intell-text technology to create eloquent text and to avoid incorrect wording.


\$259

Websearch Code 189762

StarOffice 6
By Sun Microsystems

StarOffice 6 interacts with other desktop productivity suites, including Microsoft Office and supports the Solaris operating environment, Microsoft, windows, and Linux operating systems.

- Interoperability with other desktop suites - Users can read, write, and edit Microsoft Office files to maintain current investments and co-exist with other office suites
- Supports XML file formats. Users can create, manage, and access complex documents and Web pages
- Intuitive graphical user interface (GUI) - Easy to learn and use; requires minimal retraining; speeds productivity
- Elimination of the integrated desktop Provides overall system integration


\$179

Websearch Code 190179

MAUS MasterPlan
Award Finalist in the Telstra Small Business Show Software awards

For people who need a winning, professional Business or Marketing Plan, MasterPlan's simple step-by-step question and answer format enables you to construct full financials, text and graphics in no time at all! Sample plans, real life examples and a unique financial wizard will ensure you prepare a perfect plan every time.


\$189

Websearch Code 12945

MAUS KPI Scorecard

- Makes Key Performance Indicator monitoring, reporting and analysis easy.
- Significantly reduces the time required to develop sophisticated KPI Scorecards.
- Performance reports are instantly generated incorporating text, graphs and tables.
- Assess KPIs across any time period-weekly, monthly, yearly or the time frame that best suits your industry.


\$420

Websearch Code 189940

MAUS Project Planner

- Makes Managing projects easy.
- Helps reduce costs, meet deadlines and use resources efficiently.
- Creates instant reports & graphs.
- Monitors costs, hours, resources and more.
- Includes Gantt charts for "big picture" scheduling.
- Links to MAUS Masterplan, MS Project, Word and Excel.


\$445

Websearch Code 188761

MAUS Health & Safety Planner

This application provides businesses with the necessary tools to develop an Occupational Health and Safety Management Plan. Avoid potentially costly employee litigation by improving safety standards and systems within your workplace.


\$189

Websearch Code 12908

MAUS Employee Manual

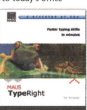
Create a handbook encompassing all of your organisations policies and procedures. The application covers issues such as holiday entitlements, employee benefits, employment contracts, recruitment, termination and much more through a simple to use question and answer format.


\$189

Websearch Code MAU011

MAUS Type Right

It takes you through the typing process step by step with fun tutorials and easy exercises. Specifically for people who are using keyboards and computers, so its approach is practical and relevant to today's office environment. Basic keyboard skills can be attained in 4-6 hours.


\$89

Websearch Code MAU029

MAUS HR Toolkit :
MAUS Performance Review + MAUS Job Descriptions + MAUS Employee Manual
FREE Copy of Business Letters
MAUS Performance Pack:
Performance Review + Project Planner

MAUS Masterplan/KPI Pack Includes:
MAUS Masterplan + MAUS KPI Scorecard

MAUS Business Planning Pack Includes:
MAUS Masterplan + MAUS Project Planner

SAVE \$227
OFF RRP
\$589

Websearch Code 129873

SAVE \$199
OFF RRP
\$599

Websearch Code 130477

SAVE \$132
OFF RRP
\$585

Websearch Code 131543

SAVE \$148
OFF RRP
\$569

Websearch Code 130123

QuarkXPress 5

QuarkXPress has expanded in step with the explosion of electronic publishing. Whether you publish in print, electronically, or both, QuarkXPress is the tool that lets you create content once and deliver it quickly and efficiently through the media options your customers demand.



Upgrade (From version 4)

\$4399

Websearch MAC 190132

Websearch WIN 190108

Full

\$3469

Websearch MAC 189843

Websearch WIN 189842


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click here to buy...

PowerQuest® PartitionMagic®

The Standard in Hard-drive Partitioning

Partitioning allows you to manage your hard drive more efficiently. Your computer views each partition as a separate hard drive, automatically giving it a drive letter, allowing you to conveniently organize your hard drive and maximize the performance of your system. Dividing your hard drive into separate partitions plays an essential role in maintaining your computer—preventing conflicts, protecting data, improving efficiency, and increasing performance.



Upgrade

\$89

191927

Full

\$125

191926



Easy-to-use wizards help you safely install and run multiple OSes.

New PartitionMagic 8.0 features include:

- **FREE** PowerQuest DataKeeper – effortless data protection software
- New step-by-step wizards – Create Backup Partition and Install New OS
- File Browser – browse, copy, or move files and folders from one partition to another regardless of partition type (e.g. Windows® [FAT/32, NTFS] and Linux® [Ext2, Ext3])
- PQBoot™ for Windows – select which OS to run on your next reboot while running in Windows

PowerQuest® Drive Image®

Drive Image is a Complete Solution for Disaster Recovery, Backups & System Upgrades



Upgrade

\$49

190190

Full

\$89

190168

Disaster can strike at anytime. Reduce your risk by protecting your data with PowerQuest's Drive Image 2002. You can quickly create hard drive images for backup to protect your data. Using a familiar Windows® interface you can create an exact copy of your entire hard drive or partition in minutes onto a Zip®, Jaz®, CD-R/W, network drive, or another partition. That way, when the inevitable virus or system crash occurs, you will have an exact image of your drive secured, ready to restore.



New easy-to-use, intuitive Windows interface.

New Drive Image 2002 features include:

- New imaging technology allows you to create and restore drive images while running in Windows
- Easy-to-use, intuitive Windows interface
- LAN support allows you to save hard drive images to, and restore from, a network drive
- Save your image files directly to another section of your hard drive by automatically creating a dedicated backup partition



System Deployment and Protection Doesn't Have to be Hard.

Are you concerned about the time, cost and complexity required to deploy and protect Windows workstations and servers? PowerQuest provides proven solutions that help IT professionals and service providers simplify and automate Windows OS deployment and server recovery.



Small to enterprise organizations use PowerQuest enterprise solutions to:

PowerQuest DeployCenter™

10 Workstations
189865 **\$379**

25 Workstations
189790 **\$949**

50 Workstations
189791 **\$1899**



Deploy Windows® workstations and servers by:

- Automating Windows OS deployments and upgrades
- Eliminating the need to physically visit each workstation
- Preserving Windows optimizations

PowerQuest V2i Protector™

191523 **\$819**



Protect Windows 2000 servers by:

- Creating a point-in-time backup of system and data files – *without server interruption*
- Reducing system and data recovery times from hours to *minutes*
- Enhancing existing backup and recovery methods
- Improving response times on service level agreements

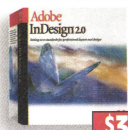
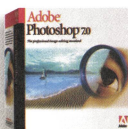
Learn how you can simplify system deployment and recovery using PowerQuest enterprise solutions, by visiting www.powerquest.com/entsolutions.



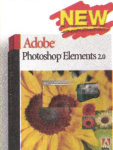
PROVEN SOLUTIONS FOR STORAGE MANAGEMENT

Adobe Photoshop Elements 2

Adobe Photoshop Elements 2.0 software provides the perfect combination of power and simplicity so you can do more with your photos. From quickly correcting red eye, color, and exposure to more creative editing, you can easily achieve outstanding results. Comprehensive Help features offer easy-to-understand explanations, definitions for using editing tools, and more. Inspirational Recipes describe how to apply amazing special effects and help you perform a variety of editing techniques. Whether you use a digital camera or a scanner, Adobe Photoshop Elements 2.0 makes digital imaging a breeze.



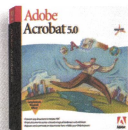
Upgrade **\$349**



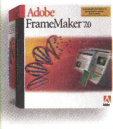
\$169
Websearch Code 191420

Adobe FrameMaker 7

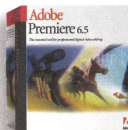
An authoring and publishing solution that combines the simplicity of word processing with the power of XML. Enjoy WYSIWYG authoring in either a familiar word processing, style-tagging mode or a fully structured environment optimized for the editing and production of valid XML. Take advantage of long document structure that includes book management features, sophisticated templates, and rich formatting options.



Upgrade **\$199**



\$1969
Websearch WIN 190258
Websearch MAC 190448



Upgrade **\$1275**

Adobe Photoshop 7.0

The world-standard image editing solution

Adobe Photoshop 7.0 software helps you work more efficiently, explore new creative options, and produce the highest quality images for print, the Web, wireless devices, and anywhere else. With the new File Browser, you can inspect image data without opening files. Effortlessly remove dust, scratches, and other flaws with the new Healing Brush. Streamline your Web design using new transparency capabilities and sophisticated rollover controls. Indulge your creativity with a powerful new paint engine and art studio brushes, plus the new automatic Pattern Maker and an enhanced, easier-to-use Liquify tool. To create exceptional imagery, rely on Adobe Photoshop 7.0, the professional image-editing standard.

Upgrade **\$349** Full **\$1415**
Websearch WIN 189936
Websearch MAC 189937

Adobe InDesign 2.0

InDesign 2.0 integrates tightly with Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat. Plus, it frees you to be more creative by delivering intuitive features that reduce elaborate design tasks to a few quick steps. When you're ready to print, the results are precise and reliable. InDesign 2.0 also makes it easy to move beyond print with built-in support for publishing pages anywhere.

Version 2.0 offers object transparency, long-document management options, one-step table creation, XML import and export, improved performance, and more.

Upgrade **\$349** Crossgrade Limited Stock **\$689** Full **\$1599**
Websearch WIN 189939
Websearch MAC 189940

Adobe Illustrator 10

Adobe Illustrator 10 software defines the future of vector graphics with groundbreaking creative options and powerful tools for efficiently publishing artwork on the Web, in print, everywhere.

Produce superb Web graphics using symbols and innovative slicing options. Explore creative ideas with live distortion tools. Publish graphics in record time with dynamic data-driven graphics and other productivity features.

Upgrade **\$349** Full **\$925**
Websearch WIN A00309
Websearch MAC A00308

Adobe Acrobat 5.0

The best way to share documents online

Whether you create business plans, spreadsheets, graphically rich brochures, or Web sites, Adobe Acrobat 5.0 software lets you convert any document to an Adobe Portable Document Format (PDF) file. Conversion is as easy as a click within your Microsoft Office toolbar (Windows only). Your team can work smarter by electronically adding comments and signing documents without leaving their Web browsers. Easily secure your documents with password protection. Anyone with the free Adobe Acrobat Reader software can open Adobe PDF files across a broad range of hardware and software, and the files will look exactly as intended with layout, formatting, and images intact.

Upgrade **\$225** Full **\$503**
Websearch WIN 111186
Websearch MAC 111187

Adobe PageMaker 7.0

The ideal page layout program for business, education, and small office, home-office (SOHO) professionals who want to create high-quality publications such as brochures and newsletters. Get started quickly with templates, graphics, and intuitive design tools; work productively across Adobe applications.

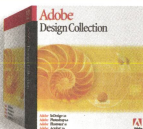
Features include, Create and view Adobe Portable Document Format (PDF) files. Import native Photoshop and Illustrator files. You can drag and drop the native file or use the Place dialogue box.

Upgrade **\$199** Full **\$1149**
Websearch WIN A00297
Websearch MAC A00298

Adobe Premiere 6.5

The essential tool for professional digital video editing. Delivering unmatched hardware support, Adobe Premiere 6.5 software is the most adaptable DV-editing tool on the market today. Now you can work more productively with real-time editing capabilities. And you can take advantage of the sophisticated new Adobe Title Designer, MPEG-2 export, DVD authoring, powerful audio tools, and more to create extraordinary video productions.

Upgrade **\$1275**
Websearch WIN 190636
Websearch MAC 190635



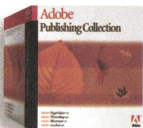
Adobe Design Collection 6

The Adobe Design Collection contains four leading-edge design and publishing applications in one fully integrated suite. Together these programs give you everything you need to create and produce professional documents across media.

Includes:

- Adobe InDesign 2
- Adobe Photoshop 7
- Adobe Illustrator 10
- Adobe Acrobat 5

Websearch WIN	190189
Websearch MAC	190203

\$2165


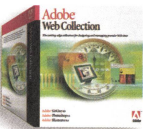
Adobe Publishing Collection 12

Publishing Collection brings together four powerful applications for business, education and small office/home office professionals. These complementary applications help you create professional looking communications for print and the Web.

Includes:

- Adobe PageMaker 7
- Adobe Photoshop 7
- Adobe Illustrator 10
- Adobe Acrobat 5

Websearch WIN	190267
Websearch MAC	190259

\$2289


Adobe Web Collection 5

Collection is a comprehensive, tightly integrated software suite that gives you the power to design extraordinary still and interactive Web graphics, optimize those graphics for efficient downloading, and build dynamic Web sites that support the latest technology and standards.

Includes:

- Adobe GoLive 6
- Adobe Photoshop 7
- Adobe Illustrator 10
- Adobe LiveMotion 2

Websearch WIN	190260
Websearch MAC	190232

\$2349
NEW

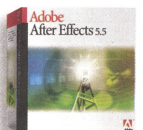

Adobe Digital Video Collection 8

Adobe Digital Video Collection delivers professional tools for putting your ideas into motion. Whether you produce projects for film, multimedia, video, or the Web, you'll gain the creative control you need to achieve superb results.

Includes:

- Adobe Premiere 6.5
- Adobe Photoshop 7
- Adobe After Effects 5.5
- Adobe Illustrator 10

Standard	
Websearch WIN	191877
Websearch MAC	192596

\$2895


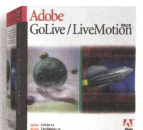
Adobe After Effects 5.5

The essential tool for motion graphics and visual effects 5.5 software provides complete creative control so you can efficiently produce motion graphics and visual effects for film, video, multimedia, and the Web. Work in a 2D or 3D compositing environment while you precisely control the position and animation of layers. Animate layered Adobe Photoshop and Adobe Illustrator files and import Adobe Premiere projects.

Standard	
Websearch WIN	190470
Websearch MAC	190448

\$1499

Professional	
Websearch WIN	190446
Websearch MAC	190447

\$3450


Adobe GoLive/LiveMotion Pack

Turn Photoshop & Illustrator files into interactive Web animations

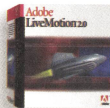
Rapidly animate, develop, manage, and deploy dynamic, interactive sites for the Web and wireless devices with the Adobe GoLive/LiveMotion Pack. Take advantage of LiveMotion software to create Macromedia Flash (SWF) animations with ActionScript and to streamline your design work flow with automation scripts. Then develop professional Web sites with GoLive software, and easily manage them with the new integrated Adobe Web Workgroup Server.

Full	
Websearch WIN	190073
Websearch MAC	190095

\$1069

Adobe LiveMotion 2

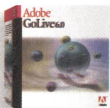
Adobe LiveMotion software is an essential tool for professional Web designers and developers who need to create dynamic, interactive content in a variety of formats, including Macromedia Flash (SWF) and QuickTime. Support for ActionScript, combined with design, coding and debugging tools, allows you to create versatile, animated content for the Web and other media.



Upgrade	
\$235	
Full	
\$959	
Websearch Code WIN	192687
Websearch Code MAC	192688

Adobe GoLive 6

Adobe GoLive 6.0 lets you quickly design, build, manage, and deploy dynamic content for the Web and wireless devices. With its built-in Web authoring and dynamic database tools, you can now move rapidly from concept to site deployment. GoLive also includes the new Adobe Web Workgroup Server, which offers sophisticated asset management features like version control that enhance workgroup collaboration and help you leverage assets more effectively.



Upgrade	
\$235	
Full	
\$939	
Websearch Code WIN	190769
Websearch Code MAC	190073



WordPerfect Office Standard 2002

A complete office solution which interacts with other desktop productivity suites including Microsoft Office

INCLUDES:

- WordPerfect 10 - word processor read, write, edit & save in Microsoft formats
- Quattro Pro 10 - spreadsheet read, write, edit & save in Microsoft formats
- Corel Presentations 10 - slide show creation
- CorelCENTRAL 10 - personal information manager



Upgrade
\$349
Websearch WIN COR95
Full
\$819
Websearch WIN COR94

WordPerfect Family Pack 4

A productivity suite including word processing, spreadsheet and other desktop applications

INCLUDES:

- WordPerfect 10 - word processor, read, write, edit & save in Microsoft formats
- Quattro Pro 10 - spreadsheet read, write, edit & save in Microsoft formats
- McAfee VirusScan
- Picture Publisher Digital Camera Edition
- Dragon NaturallySpeaking Essentials
- Britannica Ready Reference Encyclopedia
- Avery DesignPro
- Customisable interfaces to give the use standard Microsoft Office toolbars and functionality



\$185
Websearch WIN 19042

CorelDRAW Graphics Suite 11

Delivers powerful software for graphic design, page layout, photo editing and vector animation.

NOW MAC AND WINDOWS IN ONE BOX!

Includes Three Great Products -

- CorelDRAW 11 Intuitive graphic design for print and the Web
- Corel PHOTO-PAINT 11 Fast, easy and powerful photo editing
- Corel RAVE 2 Web graphics and animation
- Includes ClipArt Manual

BONUS OFFER Valued at over \$100*

Purchase CorelDRAW Graphics Suite 11 Full Version and receive a **BONUS** CorelDRAW Graphic Suite 11 Laptop Backpack

Also includes:

- Keyring
- Disposable Camera
- Sticky Notes
- Mouse Mat
- Pencils
- Erasers



* Available via redemption through Corel Customer Service, terms and conditions apply. P&H apply.

Upgrade Win/Mac Websearch Code 190507	\$515	Full Win/Mac Websearch Code 190508	\$1049
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Painter 7

- Works in sync with Adobe Photoshop, lets you combine your photo-editing expertise with advance painting capabilities.
- New watercolour technology so true to life, you can watch paints drip and blend together.
- New Liquid Ink layer mimics the viscosity and surface tension of a thick, gluey medium like ink or paint.

BONUS OFFER*
Purchase KnockOut 2 or Painter 7 and get **BONUS** Wacom Graphire2 tablet, \$182 value
Strictly limited stock so get in quickly
* Available via redemption through Corel Customer Service, terms and conditions apply. P&H apply.
Full Version Only



Upgrade Win/Mac Websearch Code COR605/607	\$455	Full Win/Mac Websearch Code COR604/606	\$825
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KnockOut 2

- Preserve fine image details that were once impossible to mask precisely.
- Hair, smoke, shadows, water, transparencies and any blurred or out-of-focus edges can now be masked with incredible precision, speeding up the entire design process.
- Ideal plug-in for Adobe Photoshop or Corel PHOTO-PAINT.

BONUS OFFER*
Purchase KnockOut 2 or Painter 7 and get **BONUS** Wacom Graphire2 tablet, \$182 value
Strictly limited stock so get in quickly
* Available via redemption through Corel Customer Service, terms and conditions apply. P&H apply.
Full Version Only



Websearch Code COR600	\$690
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Ventura 10

Corel Ventura 10 is your professional publishing solution. It's the only tool you need for transforming long, complex documents including XML files into highly formatted and visually rich publications.

Upgrade	Full
\$549	\$1515
Websearch 191550	Websearch 191557



Bryce 5

Create breathtakingly realistic 3D landscapes and animations. Striking an unique balance between power and ease of use, this innovative software is an ideal way to integrate 3D technology into your creative process.

Upgrade	Full
\$219	\$359
Websearch Code COR939	Websearch Code COR938



NEW iGrafx FlowCharter 2003

- Diagrams with built-in intelligence to aid in problem solving & decision making
- Publish Web Project - manages the publishing process to the Web
- New Cause & Effect fishbone diagram and improved graphical manipulation tools

Websearch Code 191550	\$895
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NEW iGrafx Process 2003

- Powerful graphical process modelling, simulation & comprehensive diagramming capabilities
- Visually demonstrate bottlenecks and process behaviour
- Time-weighted Statistics
- iGrafx FlowCharter 2003 also included

Websearch Code 191560	\$2230
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International
Software
Warehouse

Web Design

DECEMBER/JANUARY 2002



Special Offer
Only available until
30th November

Upgrade from 1 Studio Product
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Websearch MAC 190284

\$1299

Upgrade from 2 Studio Products
Websearch WIN 190241
Websearch MAC 190341

\$875

Full
Websearch WIN 190381
Websearch MAC 190481

\$1659

Macromedia Studio MX

An integrated suite of easy, powerful, and open development tools for creating Rich Internet Applications delivered across major platforms and devices. Includes Macromedia Flash MX, Dreamweaver MX, Fireworks MX, FreeHand, a developer edition of ColdFusion MX Server, and Macromedia Flash Player 6. Essential tools for creating everything from static websites to Rich Internet Applications. Macromedia Studio MX includes capabilities for each element of the web production process including creating graphics, laying out HTML pages, coding application logic, building rich user interfaces, and assembling complete solutions.

- Receive a free 6 month subscription to Desktop magazine and a \$150 rebate for any Macromedia training course offered by Dynamic Web Training

*Offers valid till 30th November 2002 and are available from Macromedia. Terms and conditions apply.



Special Offer
Only available until
30th November

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Upgrade from 2 Studio Products
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Websearch MAC 190341

\$875

Full
Websearch WIN 190381
Websearch MAC 190481

\$1659

Macromedia Flash MX

Macromedia Flash MX provides everything you need to create and deliver rich Web content and powerful applications. Whether you are designing motion graphics or building data-driven applications, Flash MX has the tools you need to produce great results and deliver the best user experiences across multiple platforms and devices.

- New Creative Design Tools
- Rich Media Text Support
- Action Script Developer Tools

- \$200 cash back on full version of Flash MX (Full version)*
- Free Macromedia Press book "Flash MX Visual Quickstart Guide" RRP \$46.95 (Upgrade)*

*Offers valid till 30th November 2002 and are available from Macromedia. Terms and conditions apply.

Upgrade
Websearch WIN 189623
Websearch MAC 189624

\$425

Full
Websearch WIN 189619
Websearch MAC 189620

\$999



Special Offer
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30th November

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Websearch WIN 190189
Websearch MAC 190284

\$1299

Upgrade from 2 Studio Products
Websearch WIN 190241
Websearch MAC 190341

\$875

Full
Websearch WIN 190381
Websearch MAC 190481

\$1659

Macromedia Dreamweaver MX

For the first time, every member of your development team designers, developers, and programmers can work in a single integrated environment to create, build, and manage websites and Internet applications. Macromedia Dreamweaver MX combines its renowned visual layout tools with the rapid web application development features of Dreamweaver UltraDev and the extensive code-editing support of Macromedia HomeSite. So the world's best way to create professional websites is now the easiest way to build powerful Internet applications.

- Free Macromedia Press book "Dreamweaver MX Visual Quickstart Guide" RRP \$46.95 (Full version & Upgrade)*

*Offers valid till 30th November 2002 and are available from Macromedia. Terms and conditions apply.

Upgrade
Websearch WIN 190216
Websearch MAC 190217

\$425

Full
Websearch WIN 190217
Websearch MAC 190218

\$849



Special Offer
Only available until
30th November

Upgrade from 1 Studio Product
Websearch WIN 190189
Websearch MAC 190284

\$1299

Upgrade from 2 Studio Products
Websearch WIN 190241
Websearch MAC 190341

\$875

Full
Websearch WIN 190381
Websearch MAC 190481

\$1659

Macromedia Fireworks MX

The easiest way to create, optimize, and export interactive graphics in a single, web-centric environment. Fireworks MX includes the tools to make every person responsible for creating web graphics successful.

- Modelless Vector and Bitmap Editing
- Macromedia MX Workspace/Property Inspector
- Horizontal/Customizable Pop-Up Menu Attributes
- Data-Driven Graphics Wizard
- Improved Roundtrip Table Editing with Dreamweaver
- Roundtrip Photoshop 6 Text
- Roundtrip XHTML Support
- Fully Scriptable Environment
- Quick Export Button
- Reconstitute Tables

Upgrade
Websearch WIN 190289
Websearch MAC 190290

\$319

Full
Websearch WIN 190287
Websearch MAC 190288

\$639



Special Offer
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Websearch WIN 190189
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\$1299

Upgrade from 2 Studio Products
Websearch WIN 190241
Websearch MAC 190341

\$875

Full
Websearch WIN 190381
Websearch MAC 190481

\$1659

Macromedia ColdFusion MX

Easily build rich Internet applications that integrate with databases, XML, web services, Macromedia Flash, and more. ColdFusion MX empowers developers with a productive scripting environment and integrated search and charting capabilities. Deploy on industry-standard operating systems and harness the power of the Java and .NET platforms with the legendary ease of use of ColdFusion.

Pro plus 2 year Subscription
\$2069
Websearch WIN 190329

Professional
\$1445
Websearch WIN 190327

Enterprise plus 2 year Subscription
\$12,339
Websearch WIN 190328

Enterprise
\$8819
Websearch WIN 190326

Macromedia Contribute

Now anyone can update, add and publish content to existing websites without knowing HTML. With Macromedia Contribute non-technical users can update any HTML website including sites built in Dreamweaver, FrontPage, and other tools, without affecting the quality of existing HTML code. For web professionals, this means spending less time on content maintenance while retaining control over website style, layout, permissions, and code. Contribute is a stand alone product that also works seamlessly with Dreamweaver MX and supports Dreamweaver templates, so web professionals can quickly integrate Contribute into their existing workflow.



\$239
Websearch WIN 192487
Websearch MAC 192486

Macromedia Director 8.5 Shockwave Studio

Develop interactive media on the Web, CD/DVD-ROMs and corporate intranets including 3D entertainment, interactive product demonstrations, and online learning applications, high performance multi-protocol, RealMedia support, and Shockwave Multi-user.



Upgrade from 8
\$475
Websearch WIN 190334
Websearch MAC 191786

Full
\$2199
Websearch WIN MAC411
Websearch MAC 191785



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21

Microsoft Visual C++ .net

Visual C++ .NET is the most powerful C++ tool for creating the highest-performance software for Windows and the Web. Including features like, IntelliSense Technology, Edit and Continue which significantly speeds the development process.


\$225

Websearch Code 190901

Microsoft Visual Basic .net

Reengineered to be a first-class language on the Microsoft .NET Framework, it provides the easiest and most productive route for new developers and existing Visual Basic programmers to quickly build Windows-based applications.


\$225

Websearch Code 189799

Microsoft Visual C# .net

The comprehensive toolset for creating .NET based Windows, Web applications, and XML Web services using the component oriented C# development language. A robust development package offers beginning and intermediate developers with C++ or Java experience.


\$225

Websearch Code 189647

Microsoft Windows XP Home

Windows XP Home Edition is an excellent choice for most home users, with exciting new features that help you do more with your computer.

- New visual design makes it easier to do common tasks efficiently.
- Digital photo features let you acquire, organize, and share pictures.
- All-in-one music tool for discovering, downloading, storing, and playback of the highest-quality digital music.
- Everything you need to create, share, and enjoy videos on your computer.
- Easy computer sharing and home networking.
- The ultimate communication tool for instant messaging, voice or video conversations.


\$205

Upgrade Websearch Code MSS701

\$405

Full Websearch Code MSS700

Microsoft Windows XP Professional

Windows XP Professional, provides the highest levels of performance, productivity, and security. It is the best choice for business users and for home users who demand the most from their systems. All the benefits of Windows XP Home Edition, plus:

- Greater security, including the ability to encrypt your files and folders, to protect your business data.
- Premier mobile support for the ability to work offline or access your computer remotely.
- Built-in support for high-performance multiprocessor systems.
- Designed to work with Microsoft Windows Servers and management solutions.


\$399

Upgrade Websearch Code MSS703

\$599

Full Websearch Code MSS702

Microsoft Office XP



The world's leading suite of productivity software, Microsoft Office helps you complete common business tasks, including word processing, e-mail, presentations, data management and analysis, and much more. See how the newest version, Office XP - with features like smart tags, task panes, integrated e-mail, document recovery, and send for review - can help you work smarter. Developer edition includes development tools to create Office XP based solutions.

Standard Professional Developer



Word	Yes	Yes	Yes
Excel	Yes	Yes	Yes
Outlook	Yes	Yes	Yes
PowerPoint	Yes	Yes	Yes
Access		Yes	
Tools		Yes	Yes

HOT PRICE
\$449

Upgrade Websearch Code MSS603

\$935

Full Websearch Code MSS604

HOT PRICE
\$615

Upgrade Websearch Code MSS608

\$1119

Full Websearch Code MSS607

Developer

\$1049

Upgrade Websearch Code MSS602

\$1515

Full Websearch Code MSS603

Microsoft Project 2002

Get the tool you need to schedule, organise and analyse tasks, deadlines and resources - Microsoft Project 2002, the Office project management solution.

Provides workers with the flexibility to collaboratively plan and track projects and deliver the results their business demands. It is the single planning tool needed in an organization. Improve team productivity by involving team members and other stakeholders in project management. Increase the usefulness of Microsoft Project data for users. Extend project management across the organization with Microsoft Project Central.



Microsoft Project Standard

This is the upgrade to Microsoft's core project management program for planning and managing projects from the desktop.

Microsoft Project Professional

This new desktop program includes all the core project management functionality of Microsoft Project Standard. Used with Microsoft Project Server 2002, it also offers powerful collaboration features, including enterprise resource management and analytical tools.

Standard

\$710

Upgrade Websearch Code 190095

\$1249

Full Websearch Code 190094

Professional

\$1249

Upgrade Websearch Code 190097

\$2099

Full Websearch Code 190096

Microsoft Visual Studio .net Pro

Build next generation Internet applications that target any Internet device and integrate with any platform. Visual Studio .NET provides developers with the tools for integrating solutions across operating systems and languages.


\$2195

Websearch Code 189774

Microsoft Visio 2002

A diagramming solution that assists people in visualizing and communicating ideas, information and systems. Represent complex concepts through simple diagrams, defining and describing their work more effectively than through words and numbers alone.

Standard: Quickly assemble diagrams using predefined shapes - there's no need to draw. Visualise people, projects, and processes. Create flowcharts, organisation charts, timelines, office layouts, and more. Even generate diagrams from data stored in Microsoft Excel, Microsoft Access, and Microsoft Project.

Professional: Covers comprehensive technical diagramming and drawing. Create network, Web site, database, software diagrams, facilities management diagrams and engineering schematics. All diagrams in Visio Standard are also supported. Improved reporting capabilities enable flexible data export, and a new XML file format facilitates customisation and interoperability.


\$225

Still Upgrade Websearch Code MSS680

\$429

Still Full Websearch Code MSS681

\$575

Pro Upgrade Websearch Code MSS680

\$1075

Pro Full Websearch Code MSS681



Microsoft Combat Flight Simulator 3

Combat Flight Simulator 3 places players in the position of fighter, a ground attack or bomber pilot in the thick of World War II. Players can enlist for the US Army Air Force, Britain's Royal Air Force or the German Luftwaffe as they fly missions revolving around air superiority, close air support and low-altitude tactical bombing.

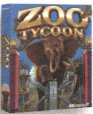


\$85

Websearch Code 191505

Microsoft Zoo Tycoon

Zoo Tycoon challenges you to build the most healthy and vibrant zoo possible. With an easy to learn interface, you can begin planning your strategy, building, managing, and maintaining a zoo with over 100 different types of animals, habitats, and building materials.



Full	Marine Mania Expansion
\$65	\$45
Websearch Code MS2598	Websearch Code 191506

Microsoft Money 2003 Standard

Provides a quick and easy way to organize and manage your personal finances. Create a budget, reduce debt, balance your checkbook, pay bills and manage your home finances. Personal Finance made simple.



\$65

Websearch Code 191391

Microsoft Picture It! Digital Image Pro

Picture It! Digital Image Pro puts you in control of your photos through powerful digital imaging tools with helpful wizards and professional quality photo projects. Choose from over 3,000 photo projects or a variety of special effects to enhance your photos for sharing through prints, email, and the Web.

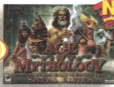


\$189

Websearch Code 191340

Microsoft Age of Mythology

Age of Mythology transports players to a time when heroes battled with monsters of legend and gods intervened in affairs of mortal men. Players create armies, develop their civilizations through the ages and manage economies through resource gathering and trade. The mythological excitement begins when players call upon the gods to act on their behalf, or reinforce their armies with more than 25 mythological creatures.



Limited
Time Only

Collectors Edition

\$129

Websearch Code 191504

Full

\$84

Websearch Code 191411

Microsoft RallySport Challenge

RallySport Challenge delivers an action-packed racing experience by combining four different types of Rally competition into one pulse-pounding game: Hill Climb, traditional Rally, Rally-Cross, and Ice Racing.

Features:

- Twenty-nine Rally Vehicles.
- Race on 48 tracks
- Network Multiplay



\$79

Websearch Code 191400

Microsoft Links 2003

Links 2003 delivers the most realistic golf experience on your PC. Links 2003 takes you to six all-new championship courses, giving you more realistic control over every shot with the new real time swing. Create your own character and play against some of the hottest pros in your own professional career; then design your home course with the Arnold Palmer Course Designer and share it online.

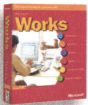


\$85

Websearch Code 191339

Microsoft Works 7

Is the latest version of the popular essential home productivity software. It includes a word processor, spreadsheet, database, calendar. Plus Works has new, professionally designed templates, and a new tool to help organize common projects. Works is even more affordable.



\$109

Websearch Code 191400

Microsoft Works Suite 2003

5 full version Microsoft software titles for your home PC at one low price.

Includes:

- Microsoft Word
- Microsoft Works
- Microsoft Money Standard
- Microsoft Encarta Standard
- Microsoft Picture It!



\$185

Websearch Code 191333

Microsoft Encarta Encyclopedia Standard 2003

Provides a wealth of current information for your whole family. Thousands of up-to-date articles and images, plus hundreds of videos, animations and audios means Encarta Encyclopedia Standard 2003 is the multimedia encyclopedia for everyday use.



\$79

Websearch Code 191335

Microsoft Encarta Premium Suite 2003

The ultimate research and reference source for the entire family. Allows you to access up to date, timely and accurate information from Encarta Encyclopedia Plus, Encarta World Atlas, live Streaming Media, web links from Web Centre, literature guides, book of quotations, translation dictionaries and many additional resources.



CD

\$165

Websearch Code 191328

DVD

\$165

Websearch Code 191370

Microsoft Optical Blue Mouse

Using the wider scroll wheel, move through documents quickly without a scroll bar. The glowing red base signifies Microsoft optical technology for a smooth and accurate experience. PS2/USB. Win/Mac.



\$55

Websearch Code 192040

Microsoft Wireless Optical Blue Mouse

No cord, no clutter. Unique clear scroll wheel. Fun optical glow - no mouse ball! Comfort for either hand. PS2/USB. Win/Mac.



\$129

Websearch Code 191960

Microsoft Multimedia Keyboard

With the press of a button start favourite media programs, navigate music and video clips or pump up the volume. With the press of a button, get instant access to Messenger, Mail, Internet and calculator commands. Use Hot Keys for My Documents, My Pictures and My Music. Log off MS Windows quickly with the press of a button. PS2, Win.



\$72

Websearch Code 192041



Wacom Graphire2 4x5 USB Tablet

Comes with Wacom's renowned pressure-sensitive pen technology for a more natural and controlled way to retouch and edit images on your computer. Graphire2 bundles Corel Painter Classic and Expression 2 Lite. Expression 2 Lite is Drawing software that allows you to reproduce a variety of brush stroke effects. Includes Pen only. Mouse sold separately.



\$165

Websearch Code WAC040

Graphire 2 4x5 with Mouse

\$179

Websearch Code WAC039

Wacom Intuos2 USB Tablet

Intuos2 Grip Pen features 1024 levels of tip and eraser pressure, tilt, angle and direction, and two side buttons that act as modifier keys, keystrokes, or mouse buttons. Intuos2 bundles Corel Painter Classic and Expression 2 Lite. Painter Classic features, over 40 pressure sensitive Natural Media tools that give you the power to draw and paint with realistic oil paints, chalks, pastels, colored pencils - even watercolors! Mouse sold separately.



\$399

Websearch Code 189279

USB 9x12 (Inc140 Mouse)

\$849

Websearch Code 189280

PERMANENT \$9.31 PER WEEK

Websearch Code 189283

USB 12x12

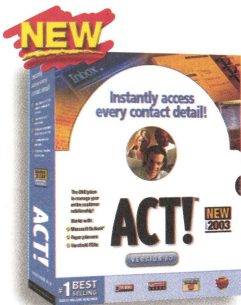
\$849

Websearch Code 189286

PERMANENT \$9.31 PER WEEK

Websearch Code 189289

#1 BEST selling, used by over 4 million users world wide, ideal solution for SME'S
Know every contact detail - Instantly with ACT!



ACT! on this new release!

- Organises all your customer information in one place
- Tracks and prioritises unlimited calls, meetings, and to-do items
- Manages your sales pipeline with forecasting tools and built-in reports
- Produces personalised e-mail merged letters and faxes with a single click
- Integrates with Microsoft Outlook e-mail, calendar, and contacts
- Synchronises with Palm OS handhelds
- Safely share information with your team

What's new in ACT! version 6?

NEW! Completely re-designed ACT! e-mail featuring 10 professional HTML templates

NEW! Improved Microsoft Outlook Integration

NEW! Active Libraries let you attach, view and edit documents within ACT!

Upgrade	\$145	ACT Single User	\$245	ACT 6 Pack	\$1195
Websearch Code 191975		Websearch Code 191976		Websearch Code 191974	

"Mobile Messenger: connecting you to the World"

- So simple to use and easy to install its just like sending an email
- Instant Customer and staff reach
- Single or Group Messaging
- Huge time and cost savings
- Message out of office staff directly
- It's the newest and coolest way of information delivery available

Mobile Messenger connects your computer to the mobile phone system in over 80 countries allowing millions of users in your company to deliver and receive messages in either single (Lite/Plus) or bulk format (Plus) from a simple to use program.

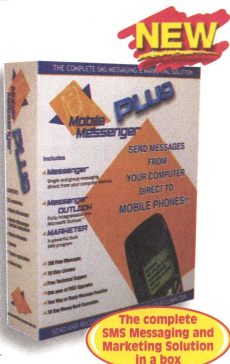
At a fraction of the cost of a mobile phone call and providing un-intrusive delivery and digital presence via a mobile phone, mobile messenger is the perfect way to communicate with clients, staff and friends.

Mobile Messenger Plus includes the following three powerful SMS programs enabling SMS message delivery worldwide directly from your computer desktop. Lite version includes Mobile Messenger only.

Mobile Messenger - A simple to use stand-alone program that allows the user to send single or group SMS messages to mobile phones worldwide from an address book or simply by typing in a mobile phone number and clicking "send message".

Mobile Messenger Outlook Integration - Fully integrates into Microsoft Outlook creating a "Send SMS" button within Outlook and provides simple single or group SMS messaging to your contacts leaving a log entry in the sent items.

Mobile Marketer - An incredibly powerful bulk SMS programme allowing the user to send a single personalised message to their entire database using our high-speed servers delivering up to 10,000 messages per hour. SMS marketing produces incredible results. Takes data directly from your database (Microsoft Excel) and removes duplicates. Simple to use merge function allows you to personalise each message.



The complete SMS Messaging and Marketing Solution in a box

Lite	\$49	Plus	\$99
Websearch Code 180722		Websearch Code 180723	



Legrand CRM

Why settle for mere contact management, when you can have a complete customer & sales management solution for under \$200?

Legrand CRM... Australia's finest business management software, offers you so much more!

How important are customers to your business? How determined are you to grow your client base and strengthen your existing customer relationships? Are you effectively managing your sales & marketing teams?

It's a real challenge to respond positively to all these questions... not only run a business successfully, but to make it grow and thrive in a competitive marketplace.

But it's not impossible, especially when you have a Customer Relationship Management (CRM) system like Legrand CRM. Locally developed, here's a practical system that was designed to help an Australian business like yours.

A Comprehensive Management Tool

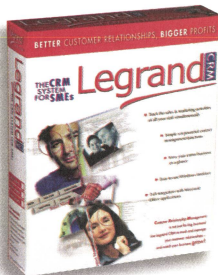
Legrand CRM is a complete customer, sales & marketing management solution that is not only powerful, but also versatile and wonderfully easy to use. Plus, it works effortlessly with Microsoft Outlook, Excel, Word, MYOB, Sybiz, Pastel and FinancePlus Accounting.

A Valuable Tool at a Great Price

Not only can you effectively manage your customers for under \$200, but you also get FREE upgrades and FREE technical support for 12 months, discounts on additional licenses and a FREE monthly e-newsletter when you register your copy of Legrand CRM.

Free 30 Day Trial Version

Still not convinced that this is the business solution for you? Then log onto our web site www.legrandsoftware.com.au to download a FREE, full working copy of Legrand CRM.



Legrand
Software

1 User
Websearch Code 189747

\$179

3 User
Websearch Code 189748

\$495

5 User
Websearch Code 189743

\$809

ContactTracker

From the makers of Tracker Software, comes ContactTracker the next generation contact manager.

ContactTracker will forever change the way you deal with your customers. It streamlines customer record keeping and combines state of the art contact management functions with the very latest Telephony technology to help you open up more business opportunities.

Microsoft Office Integration

ContactTracker integrates seamlessly with all of your favourite Microsoft Office products.

Scalable Flexible Solutions

Open SQL Database gives you the ultimate scalability from a single user to an enterprise wide solution.

Sophisticated Telephony Integration

Unique cell phone interface allows you to exchange information with your mobile phone and even send personalized bulk text (SMS) messages via your PC!

More Communication Options

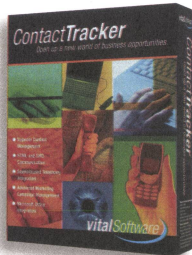
ContactTracker supports both traditional and next generation communication: Faxes, postal mail, Personalised HTML email and SMS messages.

Best Quality Reporting Tools

Integrates with the #1 reporting tool in the world, Crystal Reports

From the makers of Tracker Software.

vitalSoftware



1 User
Websearch Code 190714

\$249

5 User
Websearch Code 190715

\$1099

10 User
Websearch Code 190716

\$1789

Jasc Paint Shop Pro 7

Perfect for Digital Photography. For the traditional digital photographer and the novice user, Paint Shop Pro 7 incorporates several new intelligent photo enhancement features.



Full Version

\$199

Websearch Code JAS019

Upgrade

\$129

Websearch Code JAS021

Nero 5.5

The new built-in ultrafast Wave Editor makes Nero your all-in-one editing burning solution! Non-destructive editing lets you try many options and undo all changes; a range of audio-processing options gives you complete control over your audio files before you record them to disc, and much more!



\$169

Websearch Code NERO01

CyberLink PowerDVD 4

Offers maximum video and audio playback entertainment on the PC. Complete with numerous customizable video/audio controls that delivers the highest quality!



Standard

\$110

Websearch Code 189570

Deluxe

\$139

Websearch Code 189571



www.iswh.com.au



click here to buy...

25

Ulead

VideoStudio 6

Produce memorable movies, trim video, add your own soundtrack, create titles, and drop in effects using an easy-to-learn interface. Capture video from DV, D8, and Hi8 camcorders.



Upgrade

\$125

Websearch Code.....189895

Full

\$249

Websearch Code.....189796

Ulead

PhotoImpact 8

Everything you need for digital photo editing, creative design, and Web graphics. Digital photography: quality photo enhancement; advanced camera filters; easy photo sharing.



Upgrade

\$149

Websearch Code.....182207

Full

\$249

Websearch Code.....182206

Ulead DVD

PictureShow

Ulead DVD PictureShow lets you use your CD or DVD burner to create exciting photo slide shows that play on many standard DVD players. Now you can easily share your photos on TV! Software includes: DVD Picture Show, Photo Explorer, and Photo Express 4.0.

**\$119**

Websearch Code.....189794

MYOB RetailManager v6

With RetailManager Standard it's easy to keep track of every transaction in your store from sales, stock movements, GST and gross profit, right through to staff actions and even customer details.

New Features:

- Improvements to exporting to MYOB accounting software
- Remote site licence option
- Track serial numbers from goods received to sales
- Set a till float
- Print packing slips

**NEW**

Prices of RetailManager includes one year subscription to MYOB Cover, offering you phone and email based technical support and automatic software upgrades.

Standard Edition

Websearch Code.....182195

\$1819

MYOB RetailManager Professional

MYOB RetailManager Professional adds bulk pricing adjustment and the ability to connect with a range of time-saving peripheral devices to the point-of-sale and retail business management functionality of MYOB RetailManager Standard.

New Features:

- Bulk price adjustment
- Pad till (Quest) interface
- Enhanced touch screen functionality and compatibility
- Scales interface (Toledo, Wedderburn, Magellan models)
- Remote site licence option

**NEW**

Professional Edition

Websearch Code.....182196

\$2315

MYOB RetailManager Enterprise

MYOB RetailManager Enterprise streamlines multiple-store retail business management by giving you a global, centralised view of all your retail operations. RetailManager Enterprise consists of two components: the 'Central' module, and the 'Shop' module.

New Features:

- Streamlines multiple-store retail business management
- Consists of 'Central' and 'Shop' modules
- Enables head office communication with retail outlets
- Retail business management reports

**NEW**

Enterprise Edition

Websearch Code.....182187

\$1869

MYOB BusinessBasics

No need to jump between programs (such as spreadsheets and word processors) to get your business done. Now with MYOB BusinessBasics, you can run all your basic business tasks, create quotes, email invoices and enter transactions - from the one easy business program.

MYOB BusinessBasics is ideal for small or home-based businesses, offering you a number of significant time-saving features that make business management even easier, such as:

- Automated bank reconciliation
- An easy-entry transaction register

**NEW****\$169**

Websearch Code.....192542

MYOB Accounting Plus v12

MYOB Accounting Plus is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, advanced business reporting, and automated payroll or time billing.



Full Version

Websearch Code.....190102

\$529

Upgrade

Websearch Code.....190103

\$249

MYOB Pocket Accounts

MYOB PocketAccounts, a handheld sales and time billing program that helps businesses with a mobile sales or consulting force improve their efficiency and cash flow.

MYOB PocketAccounts runs on a Palm OS device and links seamlessly with MYOB accounting software on the desktop, allowing users to synchronise their entire day's data at the push of a button.

**\$195**

Websearch Code.....MY0044

MYOB Accounting v12

MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, and advanced business reporting.

- Streamline accounts procedures
- Comprehensive business management
- Powerful inventory management
- Contact management



Full Version

Websearch Code.....190100

\$379

Upgrade

Websearch Code.....190101

\$219

MYOB Premier v6

MYOB Premier is for businesses that need to streamline accounts procedures, whether through simplifying complex inventory issues, running an automated payroll, time billing, accessing advanced reporting or increasing productivity with multi-user access.

Premier's combination of productivity enhancing features will appeal to any business that has complex inventory requirements, works with more than one currency, or requires multi-user access.



Websearch Code.....189916

\$1079

MYOB AccountEdge

MYOB AccountEdge is the ideal accounting and business management software solution for businesses using the Mac.

- Maintain accurate accounts
- Process sales and purchases
- Track your inventory and your money
- Process your payroll
- Track your billable time
- Build better customer and supplier relationships
- Manage your business - all from your Mac.



Websearch Code.....190200

\$499

**iswh**International
Software
Warehouse

Accounting

DECEMBER/JANUARY 2002

***WIN***See below for
Terms & Conditions.**Quicken CashBook 2003 Home & Business**

- Accounting, Finance and Investments
- Intuitive and easy accounting for the home and business
- Create and email estimates, invoices and adjustment notes
- Manage accounts receivable and payable
- Track GST to assist in preparing your BAS
- BAS and PAYG reporting
- Simple Money Management to track bank balances, credit cards, income and expenses
- Track and compare your investments including superannuation
- Learn how to get out of debt faster and build your wealth
- New Taxes Centre - estimate personal income tax and online lodgement

NEWFull Version
Websearch Code 101474 **\$329**Upgrade
Websearch Code 101475 **\$139****Quicken QuickBooks 2002 Lite First Business**

Easy to learn QuickBooks navigator uses flow charts to guide you step by step. Learn how to use the product as you go with 'How do I'.

Speeds invoicing remembers customers, products and services, calculates your GST/BAS for you. Track who owes you money and what you owe, track invoices and bills until paid, handles cash and credit sales. Calculates vendor discounts & finance charges.

No need to know about debits, credits, posting and closing.
QuickBooks speaks your language!**NEW****\$185**
Websearch Code 100390**Quicken QuickBooks 2002 Small Business**

- Easy to use Business Accounting
- Manage the GST
- Write cheques and pay bills
- Create invoices
- Fully integrated BAS - lodge online
- Works great with Windows XP Pro
- Manages Accounts Payable and Receivable
- Full inventory control
- Comprehensive management reporting

Full Version
Websearch Code 100940 **\$379**Upgrade
Websearch Code 100957 **\$199**Subscription
Websearch Code 100960 **\$185****Quicken QuickBooks 2002 Small Business Plus Payroll**

Quicken Payroll is a feature rich payroll product specially designed for the small to medium market. Quicken Payroll provides a streamlined process, giving you time to manage your business by spending less time on administration.

Quicken Payroll gives you the ability to comply with the latest requirements. Allows reports to be edited and data exported in a number of formats (e.g. text, excel).

Full Version
Websearch Code 100949 **\$515**Upgrade
Websearch Code 100956 **\$260**Subscription
Websearch Code 100961 **\$230*****FREE MOUSE***See below for
Terms & Conditions.**Quicken QuickBooks 2002 Pro Multi-User**

- Full integration with Excel (includes formulas, filters, subtotals, and formatting).
- Full integration with Word (easy step by step wizard helps you send letters)
- Full synchronization with Outlook (key contact information only once).
- Multiple Price Levels (up to 20 price levels, changed on the invoice or set on the customer)
- Powerful, easy to use Payroll system.

Full Version
Websearch Code 100950 **\$1065**Upgrade
Websearch Code 100953 **\$529**Subscription
Websearch Code 100962 **\$445****FREE mouse!****FREE Microsoft Optical Wheel Mouse!**Buy, Upgrade or Subscribe to QuickBooks Pro 2002 and receive a Microsoft Optical Wheel Mouse **FREE**.

Offer only valid for purchases made between 1 December 2002 and 31 January 2003. All entries must be received by Quicken before 14 February 2003. This offer cannot be combined with any other offer. Quicken reserves the right to modify or withdraw the offer at any time without notice. Quicken accepts no responsibility for lost or misplaced mail. Please allow up to 60 days for delivery of Microsoft Optical Wheel Mouse.

**Power Tools for your Home or Office!****win****Power Tools for your Home or Office!**Buy CashBook 2003 Home & Business and you could **WIN** one of five DeLonghi EC430E Espresso MachinesOffer only valid for purchases of CashBook 2003 Full Version or Upgrade. CashBook 2003 must be registered with Quicken at the time of the draw to be eligible to win. All entries must be received by 31 December 2002. Competition will draw on 21 January 2003 and winners will be announced on January 28 2003 in The Australian. For full terms and conditions visit www.quicken.com.au TC permits: NSW: T102/0000, SA: T02/0021, NT: N102/3710, ACT: T02/0044.**Personal 2002 2nd Ed.****\$75**
Websearch Code 100945**PersonalPlus 2002 2nd Ed.**Full Version
\$115
Websearch Code 100946Upgrade
\$63
Websearch Code 100955**ShareAnalysr 2****\$179**
Websearch Code 100145**OnlineStore 2002****\$185**
Websearch Code 100955**PayrollPremier 2002****\$399**
Websearch Code 100951**www.iswh.com.au**

click here to buy...

27

WinFax Pro

WinFax PRO 10.0 is the leading fax management software for small businesses. Its high-quality faxes help you project a professional image to your clients and customers. When image clarity is vital, you can generate photo-quality faxes. You can even send forward faxes via email to people who don't have fax hardware or software.

**\$119**

Websearch Code 189292

Symantec AntiVirus 8.0 Small Business solution for 5, 10 or 25 Users

For small managed networks consisting of 1 server and workstations, provides automated, centralized virus protection and management. Additional server or workstation licenses may be purchased through the Symantec Value License Program.

Also available with support for Desktop, Server & Microsoft Exchange. It automatically detects and removes old and new viruses on the Exchange servers.

**\$669**

Websearch Code 189293

\$1149

Websearch Code 189292

\$819

Websearch Code 189291

\$1399

Websearch Code 189290

BONUS DVD or VIDEO

with purchases of Norton Internet Security 2003 or Norton SystemWorks 2003

- Grease
- Saturday Night Fever
- About a Boy
- Ferris Bueller's Day Off
- The In Crowd
- The In Crowd

Select below to add either. No mail-in redemption. See box for details. Offer ends January 13, 2003.

Bonus GREASE Video

when you purchase Norton AntiVirus 2003

See box for details. Offer ends January 13, 2003.

Norton Internet Security 2003

Symantec's Norton Internet Security 2003 provides essential protection from viruses, hackers, and spyware threats. Included are full versions of Norton AntiVirus and Norton Personal Firewall, which efficiently defend your PC from the most common Internet dangers. You also get Norton Spam Alert, and Norton Parental Control.

\$30 MAIL-IN UPGRADE REBATE*

Standard Websearch Code 191958 **\$122**

5 User Pack Websearch Code 192310 **\$369**

***\$30 MAIL-IN UPGRADE REBATE: Norton SystemWorks 2002 Standard Edition/ Norton Internet Security 2005 Upgrade**

For previous owners of Symantec/Norton retail packaged product or pre-loaded (OEM) or downloaded full version Symantec software. Proof of previous ownership is required. Please retain your sales receipt to submit rebate request. Offer only applies for full version retail packaged purchases of Norton SystemWorks 2003 or Norton Internet Security 2002. Offer is not valid in conjunction with any other rebate offer. Offer ends 3/1/2003.

****\$50 MAIL-IN UPGRADE REBATE: Norton SystemWorks 2005 Professional Edition Upgrade**

For previous owners of Symantec/Norton retail packaged product or pre-loaded (OEM) or downloaded full version Symantec software. Proof of previous ownership is required. Please retain your sales receipt to submit rebate request. Offer only applies for full version retail packaged purchases of Norton SystemWorks 2003 Professional Edition. Offer is not valid in conjunction with any other rebate offer. Offer ends 3/1/2003.

BONUS GREASE VIDEO OR **CHOICE OF VIDEO OR DVD

Bonus Offer #1 - GREASE VIDEO

*Receive a bonus VIDEO of the hit movie Grease when you purchase either Norton AntiVirus 2003/5 User pack, or Norton Personal Firewall 2003 or Norton Utilities 2002. Offer Valid between November 25, 2002 and January 13, 2003. Via mail-in redemption. See box for details. Academic versions are not included in this offer. Conditions Apply.

OR - Bonus Offer #2 - CHOICE OF DVD OR VIDEO

**Receive a bonus video or dvd. Choose from either: Grease, Saturday Night Fever, Ferris Bueller's Day Off, The Truman Show, Ghost or Top Gun when you purchase either Norton SystemWorks 2003 or Norton SystemWorks 2003 Pro or Norton Internet Security 2003/5 User pack or Norton Internet Security 2003 Pro. Offer Valid between November 25, 2002 and January 13, 2003. Via mail-in redemption. See box for details. Academic versions are not included in this offer. Conditions Apply.

Norton AntiVirus 2003

This easy-to-use program scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work. And automatic updates help defend your PC against new viruses. Protect your PC today with award-winning Norton AntiVirus.

\$92

Standard Websearch Code 191988

\$275

5 User Pack Websearch Code 192309

Norton SystemWorks 2003

Symantec's Norton SystemWorks 2003 is the smartest way to solve computer problems. It includes award-winning Symantec products and additional utilities that help you protect your PC from viruses, optimize performance, fix and prevent problems, recover from system failures, clean out Internet clutter, and keep dial-up connections active when you're online.

\$126

Standard Websearch Code 191940

pc Anywhere 10.5

Symantec's pcAnywhere is the world's leading remote control software. Encryption and authentication ensure secure access to remote computers. You can speed up remote control performance with the new optimization wizard. pcAnywhere also works with cable and DSL modems for faster remote connections. And now you can select and transfer files more easily than ever.

\$239

Standard Websearch Code 189237

\$475

5 User Pack Websearch Code 189238

Norton Personal Firewall 2003

Symantec's Norton Personal Firewall 2003 keeps hackers out and personal data in. Including intrusion detection, application control, and privacy protection in one easy program. It hides your PC from hackers, blocks suspicious incoming connections, stops malicious programs from spying on your system, and prevents confidential information from being sent out.

\$82

Standard Websearch Code 191957

Norton SystemWorks Pro 2003

Symantec's Norton SystemWorks Pro 2003 Professional Edition proves advanced problem-solving solutions to maximize PC performance. Includes award-winning Symantec products and valuable additional utilities to protect your PC from viruses, optimize performance, diagnose and fix problems and recover from disasters.

\$169

Standard Websearch Code 191941

Norton Ghost 2003

Symantec's Norton Ghost 2003 protects your data from computer disasters. The intuitive Windows interface makes it easy to create regular backups of your hard drive. You don't even need to make a boot disk. File restoration is simple from the comprehensive disk image. Also available as a component of Norton SystemWorks Professional.

\$135

Standard Websearch Code 191942

\$395

5 User Pack Websearch Code 192311

**iswh**International
Software
Warehouse

Database

1/2 Price***Purchase a
FileMaker Pro 6
5-User Pack and
receive FileMaker Server
for 1/2 price.**

FileMaker Pro 6 5-User Pack and FileMaker Server together are normally priced at \$4600 RRP. But now for a limited time you can purchase both FileMaker Pro 6 5-User together with FileMaker Server for just \$3495!

Terms & Conditions*Further details available at: www.filemaker.com.au/promos/. Purchases must be made at the same time. Conditions apply.**FileMaker Pro 6**

FileMaker Pro 6 database software extends FileMaker's legendary ease of use with new, efficient ways to import digital images. It provides a virtually limitless capability for data exchange and application integration. Complete with enhanced productivity and formatting tools, as well as a host of instant productivity templates, FileMaker Pro 6 is the best solution for quickly creating and sharing information.

- More than 20 NEW, ready-to-use customisable templates and a Layout Report Assistant provide instant productivity for business, education and home
- Rapid, "hassle-free" multimedia and digital image importing to enhance your business solutions and bring your data to life
- XML Import and Export enables data interchange with virtually anyone, whether or not they use FileMaker
- NEW Format Painter and other time-saving layout and word-processing tools for creating professional-looking forms
- Microsoft Office integration - automatically convert Microsoft Excel spreadsheets into functional, modifiable database solutions so you can sort, search, report, track, link and summarise your data with ease
- Instant Web Publishing allows easy collection and sharing of information via the Web

Full
Websearch Code 190548**\$545**Upgrade
Websearch Code 190549**\$269****FileMaker Developer 6**

FileMaker Developer 6 is the tool of choice for creating custom FileMaker solutions for deployment across workgroups, distribution as royalty-free runtime applications, or publication on the Web. Along with the benefits of FileMaker Pro 6, FileMaker Developer 6 includes updated time saving development tools. Test and verify your scripts' steps with the Script Debugger.

Document the schema of your FileMaker solutions with the Database Design Report. Use the Developer Tool to protect your solutions from modification and limit user controls, or to deploy your solutions in Kiosk mode or as a stand-alone application. Whether you are developing commercial or corporate solutions, FileMaker Developer 6 is the indispensable tool for creating, customising and deploying FileMaker solutions.



Websearch Code 192064

\$1089**FileMaker Mobile 2.1**

FileMaker Mobile 2.1 software lets you easily synchronise information between local FileMaker Pro 5.5 and 6 databases and Palm OS or Pocket PC handhelds. In just a few clicks, FileMaker Mobile 2.1 builds a streamlined database and loads the records and fields you select. Now with Symbol barcode reading device support. Leverage the powerful desktop database functionality of FileMaker Pro, for a comprehensive desktop-and-handheld database system that makes it easy to run your business, workgroup, or project and take the information you need with you wherever you go.

**Now works with
Pocket PC and
Palm OS!**Palm for illustration
purposes only.

Websearch Code 192416

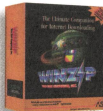
\$89**FileMaker Server
(works with FileMaker Pro 6, 5.5 & 5 versions)**

An easy-to-use relational database server is the best way to host your FileMaker Pro solutions on Windows 2000, Mac OS X, Mac OS and Red Hat Linux. This high-performance server engine supports up to 250 FileMaker Pro guests simultaneously on multiple platforms with several protocol options and up to 125-hosted files. It includes automatic plug-in updating, scheduled backups and remote administration tools to monitor server activity and to control guest and file connections.

While FileMaker Server is IT-friendly, it's also so easy to run that non-technical people will feel comfortable with its installation and day-to-day management. With automatic update of plug-ins, increased network performance, automated backups, auto disconnect of idle guests, and easy set up and administration, FileMaker Server is the best way to host your FileMaker Pro workgroup solutions.

Full
Websearch Code 130775**\$2095**Upgrade
Websearch Code 190564**\$1085****Winzip 8**

The archive utility for Windows and the ultimate companion for Internet downloading. Zipping safely compresses the data in your files, so that your files then occupy less space, allowing you to send and save more. Multi-user licenses available. Picture used for illustration purposes only.

**\$89**

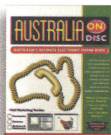
Websearch Code 190595

**Australia on
Disc May 2002
Edition**

- All 56 National Telephone Directories
- Over 1.3 Million Business Listings
- Over 6.8 Million Residential Listings
- Over 177,000 fax numbers
- Over 49,000 E-Mail Addresses
- Over 63,000 Web Addresses

At the touch of a button, lists, labels and reports can all be generated or telemarketed direct from AOD, using the built in dialer (modem required).

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Database & Office Applications Computer Products at Rock Bottom Prices

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JMP 5 For Windows and Macintosh.

- Designed for anyone who wants to discover relationships and outliers in their data.
- If you perform any sort of statistical analysis (eg. Crystal Reports to generate reports, or MS Excel to Manipulate data), you'll likely want JMP.
- Comprehensive set of statistical tools as well as Design of Experiments and Statistical Quality Control in a single package.
- Dynamically links statistics with graphics to interactively explore, understand, and visualise data
- Reduce wastage and lower costs via early detection of non-conforming data
- Internet access allows you to browse web pages from JMP and get files from a http address

Now Native for Windows XP and Macintosh OS X!



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ZoneWerx IntraZone 3

An "out-of-the-box" Intranet solution for small and medium businesses or divisions and project groups in larger organisations. Streamlines your day-to-day operations by providing staff with easily accessible communication tools, scheduling, discussion forums, project management, quotation pipelines, templates, company forms, policies, training, information, news and events. Access through a standard Internet browser.



\$315
Websearch Code 130527

Crystal Reports 9 High-productivity Report Creation and Integration

Crystal Reports is a high productivity reporting technology for rapidly transforming almost any data into powerful, interactive content. Tightly integrate dynamic content into .NET, Java and COM applications for end user viewing, interaction and modification at runtime. Let end users access and interact with key report objects via portals, wireless devices and Microsoft Office documents.

What's new in Version 9?

- Simplified, cost-effective deployment licensing
- Scalable Report Server for complete control over web application integration
- New time-saving design tools like the Repository for report component reuse
- Flexible Java, .NET and COM SDKs
- Direct SQL editing for unlimited control over database connectivity
- Hassle-free upgrade experience with side-by-side installation
- More and more!

Crystal Reports 9 Advanced Edition

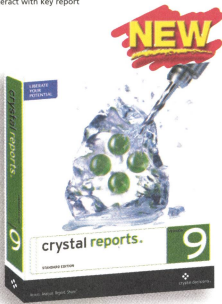
Designed for creating, integrating and deploying reports within complex enterprise web and wireless applications without increasing development overhead. Includes the complete Crystal Reports feature set plus more web flexibility.

Crystal Reports 9 Developer Edition

Designed for creating and integrating reports into basic thick-client and web applications, the Developer Edition includes the report design and productivity tools of the Professional edition plus powerful application integration technology.

Crystal Reports 9 Professional Edition

Designed for high productivity report creation and small-scale distribution, the Professional Edition includes data connectivity and report design technology plus an introductory license for web-based report viewing by small teams.



Standard
\$325
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Professional Upgrade
\$429
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Professional
\$809
Websearch Code 191542

Developer Upgrade
\$529
Websearch Code 191538

Developer
\$969
Websearch Code 191537

Xerox OmniPage 12

Convert paper and PDF files into Digital Documents that you can Edit, Search and Distribute. OmniPage remains the single best paper-to-digital conversion tool. Update your Lite version today.

Key features of OmniPage Pro 12:

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- Convert and Edit PDF documents
- Create searchable PDF files
- Recognise multiple languages
- Retain scanned colours
- Spreadsheet recognition



Upgrade
\$325
Websearch Code 192109

Xerox PaperPort Deluxe 8

Voted 'The World's best Paper Management Software'. The easiest way to turn paper into organised digital documents, that everyone in your office can quickly find and use.

Works with any scanner or multi-function device.

Why to need paper management software:

- Fast access to your documents
- Save space and time
- Converts paper into digital
- Hassle free searches
- Visual thumbnails
- Easy viewing of E-Mails



Upgrade
\$149
Websearch Code 189709

Full
\$209
Websearch Code 189073

Xerox TextBridge Pro

Easy and accurate, entry-level OCR software, no more retyping.

TextBridge Pro 11 easily turns printed pages into digital documents that can be used with your favourite Windows based application.

Reasons to consider TextBridge Pro 11:

- Never again retype originals
- Fully XP compatible
- Create web pages
- Recognises colour text
- Best entry level OCR yet



Upgrade
\$89
Websearch Code 192538

Full
\$149
Websearch Code 192537

Xerox OmniForm Premium 5

Quickly and accurately make your Paper based forms Digital.

OmniForm 5.0 significantly reduces the time and expense associated with creating forms, editing, managing, distributing and collecting from data. Simplify the forms process with OmniForm 5.0.

How OmniForm will help you:

- Makes your paper forms digital
- Automatic data collection
- Enables Digital signatures
- Keeps your digital forms secure
- A MUST for Form designers
- Essential for Forms Originators



Upgrade
\$1109
Websearch Code 192543

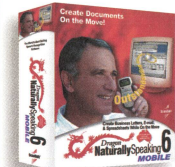
Full
\$1479
Websearch Code 189424



Dragon NaturallySpeaking Mobile v6

Instantly Create Documents by Voice While on the Move!

Get work done even while you're away from your computer. Dragon NaturallySpeaking Mobile is the go-anywhere dictation solution for people on the move. Talk into the palm-sized recorder, wherever you are, then later plug the recorder into your PC and the software automatically transcribes your dictation. With the included Dragon NaturallySpeaking Preferred software, you can create documents by voice in Windows applications such as Microsoft Word, Microsoft Excel, Microsoft Outlook Express, and Corel WordPerfect.

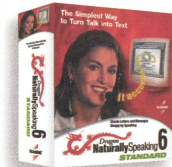


Full	\$669
Websearch Code 190204	

Dragon NaturallySpeaking Standard v6

Instantly Create Documents by Voice!

Say goodbye to your keyboard and mouse and create documents as fast as you speak. Write messages and letters even send e-mail just by talking! Dragon NaturallySpeaking Standard learns your voice in as little as five minutes. Integrated with Microsoft Word, Microsoft Outlook Express, America Online, and Corel WordPerfect, users can dictate into virtually any Microsoft Windows based application.

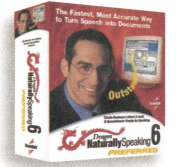


Upgrade Websearch Code 190080	\$135
Full Websearch Code 189935	\$189

Dragon NaturallySpeaking Preferred v6

Instantly Create Documents by Voice!

Does creating documents, spreadsheets, and e-mail take up a large part of your day? Work faster and more productively with Dragon NaturallySpeaking Preferred speech recognition software! Speak into documents appear on screen and in memos, letters, reports, and e-mail. Integrated with Microsoft Word, Microsoft Excel, Microsoft Outlook Express, and Corel WordPerfect. Dragon NaturallySpeaking Preferred works with virtually all Windows based applications.



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Full Websearch Code 189934	\$369

Trend Micro PC-cillin 2002

- Enhanced anti-virus scanning
- Includes Personal Firewall for secure Internet computing
- Includes Trend Micro's PC-cillin for Wireless
- Registered Users have access to 12 MONTHS FREE VIRUS PATTERN UPDATES!

\$20 CASHBACK



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\$75
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Borland Optimizit Suite 5

Complete performance solution for Java

Borland Optimizit Suite 5 makes performance management for Java easier than ever. Seamless integration with the Borland JBuilder development environment boosts team productivity, dramatically improving application performance and supporting the development of fast, scalable, and reliable applications. Optimizit Suite is the undisputed first name in performance management for Java.

The Automatic Memory Leak Detector (AMLD), enables teams who are brand new to Java to immediately solve memory leaks.

Optimizit Suite integrates with popular application servers and IDEs, and it supports the IBM AIX, HP-UX, Windows, Solaris, Linux, and Mac OS X platforms.



Call for Pricing

Borland JBuilder 8 SE

The leading Java development solution

Build powerful Java applications with Borland JBuilder, the leading cross-platform Java development solution. JBuilder 8 SE enables developers to rapidly create and deploy Java applications with an extensible source code editor, compiler, visual designers, and timesaving wizards.

- Maximize development productivity with refactoring, Javadoc tools, team development, CVS integration, and JDK switching.
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 - Speed application development with reusable JavaBeans and advanced HotSwap debugging.
 - Speed coding and reduce syntax errors with CodeInsight and ErrorInsight technologies.
- Develop and deploy applications on the Windows, Linux, and Solaris platforms. JBuilder SE delivers a flexible, open solution that supports Java standards.



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Borland Delphi 7 Studio Professional delivers new, integrated technologies for increased productivity. Get your e-business and Web Services applications ready for the path to the Microsoft .NET Framework with the Delphi 7 Studio Migration Kit for .NET. Expand your market opportunities: use one code base to leverage the power of cross-platform development for Linux with the included Borland Kylix 3 for Delphi environment.

Build highly productive applications with new fully integrated technologies that enable you to add interactive content to your Web sites, deliver powerful reports, and easily navigate UDDI directories, with added Web Services fail-over support.

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Vet Anti-Virus

Complete virus protection. With Net Surfer access the web for unlimited upgrades for one year. Premium offers all the advantages of Net Surfer with the additional benefit of mailed quarterly upgrades.



Net Surfer \$79 Websearch Code VET006
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Premium \$105 Websearch Code VET007
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Palm Zire

The Palm Zire is ideal for storing all your events, appointments, names and phone numbers all in one place and its small and light so you can take it where ever you go. The Zire allows you hold thousands of details, plus applications and data.

Memory: 2MB
Operating System: Palm OS v4.1
Display: Screen Monochrome Display, 160 x 160 Pixel Display
Processor: Motorola Dragonball EZ, 16MHz Processor



\$235

Websearch Code 182389

Palm m130

Supports more than 65,000 colours. Convenient rechargeable battery. Built-in lithium-ion battery automatically recharges in your HotSync® cradle. Add games, applications, eBooks and more on MultiMediaCard and SD expansion cards. Snap an MP3 player, portable keyboard or GPS receiver to the Palm Universal Connector.



\$639

RENTSMART \$7.00 PER WEEK*
Websearch Code 189798

Palm m515

With 16MB of internal memory, you can store hefty applications, PowerPoint presentations and even video clips with room to spare. Bonus software lets you view Word, Excel and PowerPoint files right on your handheld, send email, read eBooks, view video clips and photos, browse Web content offline and more.



\$849

RENTSMART \$10.03 PER WEEK*
Websearch Code 189917

*Toshiba Satellite Series

1400 Cel 1.2GHz Win XP Pro

Processor: Intel Celeron Processor 1.2GHz, 256MB L2 cache
Memory: 128MB expandable up to 512MB
Storage: 20GB HDD, 8x maximum DVD-ROM
Display: 1024 x 768 resolution, 14.1" diagonal
Communication: 56K modem, Intel 10/100 Base-TX Ethernet LAN
Graphics: M15358 PCI bus sound processor
Multimedia: Cyber ALADIN-T graphics controller, 128-bit 16MB UMA video memory
Software: MS Windows XP Pro
Weight: 3.3kg
Warranty: 1 year parts & labour

***PLUS FREE 128MB & BAG Limited Offer!**



\$2345

RENTSMART \$23.00 PER WEEK*
Websearch Code 192014

Toshiba Satellite Pro Series

TE2100 P4 1.6GHz Win2K/XP Pro

Processor: Intel P4 1.6GHz, integrated 512KB Level 2 cache
Memory: 256MB PC2100 DDR memory upgradable to 512MB
Storage: 30GB HDD, 8x DVD-ROM, external 1.44MB USB FD
Display: 14.1" diagonal with up to 16 million colours, XGA
Communication: 56K modem, 10/100 Base-TX E-net, Intg WiFi Antenna(802.11b)
Graphics: NVIDIA GeForce4 4200GO graphics controller, 16MB video memory
Multimedia: Yamaha YMF753
Software: MS Windows 2000 or Windows XP Pro
Weight: 2.7kg
Warranty: 1 year parts & labour

\$2999

RENTSMART \$29.41 PER WEEK*
Websearch Code 190659

IBM ThinkPad R32

Model: 2658BPM
Processor: Intel Pentium 4 processor - M, 1600MHz
Memory: 256 MB expandable 1024MB
Storage: 20GB HDD, 8x DVD-ROM
Display: 14.1" TFT, 1024 x 768
Communication: 56K V.92 designed modem, 10/100 Ethernet
Graphics: ATI Mobility RADEON 7000, 16MB video memory
Multimedia: Sound Blaster Pro 16 compatible sound system
Software: MS Windows XP Professional
Warranty: 1 year parts & labour
Weight: 2.5 Kgs



\$2795

RENTSMART \$27.41 PER WEEK*
Websearch Code 190671

IBM ThinkPad R32

Model: 2658BGM
Processor: Intel Pentium 4 - M, 1700MHz
Memory: 256MB DDR SDRAM expandable to 1024MB
Storage: 30GB HDD, CD-RW/DVD-ROM Combo III (16X/10X/24X/8X Max)
Display: 14.1" TFT, 1024 x 768 resolution
Communication: 56K V.92 designed modem, 10/100 Ethernet
Graphics: ATI Mobility RADEON 7000, 16MB video memory
Multimedia: Sound Blaster Pro 16 compatible sound system, 2 integrated speakers
Software: Win XP Pro, Office XP Small Business
Warranty: 1 year parts & labour
Weight: 2.8 Kgs

\$3225

RENTSMART \$31.63 PER WEEK*
Websearch Code 192803

LG 15" 563N CRT Studioworks Digital Monitor

15" (13.8" visible) screen size, Pixel pitch: 0.28mm. Pixel configuration: Dot Pitch. Face Treatment: Anti-glare, Anti-static. Maximum Resolution Flicker-free: 1024 x 768 at 75Hz. Horizontal Scan Frequency: 30-61KHz. Vertical Scan Frequency: 50-120Hz. Video Bandwidth: 78MHz. Dimensions (WxDxH): 360 x 386 x 378mm. Weight: 12.7kg.



\$209

Websearch Code 191511

Philips 17" 107E CRT Monitor

17-inch (16.0" VIS) colour monitor with excellent front of screen performance for use with MACs and PCs. Autoscan covers horizontal frequencies up to 70 kHz offering a maximum resolution of 1280 x 1024 with flicker free display of 1024 x 768 at up to 88 Hz. Flat Square High Contrast CRT with high-resolution 0.27 mm dot pitch (0.23 hdp). World's shortest 17-inch conventional monitor. Multimedia Base and USB Hub option.



\$260

Websearch Code 189231

IBM 17" E74R CRT Black Monitor

It has a 17-inch CRT with a viewable image size of 16.0 inches (406 mm), incorporating a 0.27 dot pitch. It also has a maximum horizontal frequency of 68kHz for flicker-free operation at an optimum 1024x768 pels at 85Hz with a maximum addressability of 1280x1024 pels. 3 year customer-carry-in and exchange warranty.



\$339

Websearch Code 192019

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December 2002

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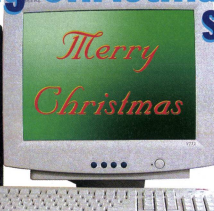
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- AMD Duron 1.3Ghz Processor
- 128MB SDRAM
- 40GB Hard Drive
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- Integrated Video
- 17" Monitor
- 10/100 Ethernet
- 56K Internal Modem
- Minitower Case
- AC97 Audio
- Keyboard, Mouse & Speakers
- MS Windows XP Home Edition



Adelong Christmas



Special System

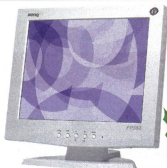
\$999

SHADE333



15" BenQ LCD FP553

Extraordinary clarity at the price of traditional CRT monitor, the FP553 is a LCD with a 15" viewable area.



SPECIAL

\$645

MODEX000

SideWinder Force Feedback Wheel

Shold on tight, because if you push the wheel it is going to push back. This wheel knows the difference between 55mph and 155mph, the difference between smooth sidewalks and gravel alleys. Includes anti-slip pedals



\$259

LINKS011

BenQ 48X/16X/48X CDRW

A great Xmas buy, this BenQ CDRW burns CD-R disks at 48X and CDRW at 16X, translating to a full burn in under 3 minutes. Includes CD recording software and buffer under run protection.



SPECIAL

\$119

MODEX000

Linksys Cable/DSL Router + 4 Port Switch

The Linksys BEFSR41 is a perfect option to connect multiple PCs to a Cable/DSL Internet connection. Features a 4 Port 10/100 Switch, DHCP and easy to use GUI configuration tool.



\$159

WALL000

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Adelong Computers

Adelong SOHO Advantage

- 256MB DDR RAM
- 40GB 7200RPM Hard Drive
- 1.44Mb Floppy Drive
- Integrated Video Accelerator
- 10/100 Ethernet Controller
- 52X CDROM
- 17" Monitor
- ATX Minitower Case
- Integrated Sound
- Keyboard, Mouse, Speaker
- MS Windows XP Home Edition



Upgrade
to
40x12x48x
CD-RW
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1.8Ghz Intel Celeron™ Processor
\$1199 514DE327

AMD Athlon™ XP 2000+ Processor
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Intel Pentium™ 4 2.0Ghz Processor
\$1399 514DE329

Upgrades*

Upgrade to 512MB DDR Ram
\$155

Upgrade to 60GB HDD
\$30

Upgrade to 80GB HDD
\$60

Upgrade to 19" Monitor
\$195

Upgrade to Aitec Lansing ACS300
\$69

Add 16X DVD-ROM
\$75

Add 40x10x48x CDRW
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Add PCI Firewire Card
\$65

Special Offers

Add MS Worksuite 2002
\$125

Add MS Office XP Pro
\$499

Add Symantec Antivirus 2002
\$35

* For Adelong Soho and Power Advantage systems



Adelong Advantage Server

- Dual AMD Athlon MP 2000+
- 512MB DDR RAM
- 80GB 7200RPM Hard Drive
- 1.44Mb Floppy Drive
- 64MB GeForce 2 MX 400 Graphics
- 17" Monitor
- 52X CDROM
- 10/100 Intel Pro Ethernet
- Keyboard, Mouse



Mid Server Case**
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Upgrade to 4U
Rackmount Case
\$345



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2

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Adelong Power Advantage

- 256MB DDR RAM
- 40GB 7200RPM Hard Drive
- 1.44Mb Floppy Drive
- 64MB GeForce 4 MX440
- 17" Monitor
- 52X CDROM
- ATX Minitower Case
- 10/100 Ethernet Controller
- Integrated Sound
- Altec Lansing AVS200
- 56K Internal Modem
- Keyboard, Mouse
- MS Windows XP Home Edition

AMD Athlon™ XP 1800 +

\$1399

SYNDC329

Intel Pentium™ 4 2.0Ghz

\$1595

SYNDC322

AMD Athlon™ XP 2200

\$1599

SYNDC330

Intel Pentium™ 4 2.4Ghz

\$1655

SYNDC333



Please see page 2 for options and add ons.

Exclusive Upgrades for Power Advantage

Altec Lansing ACS300 Speakers **\$40**

Leadtek TI4200 128MB **\$199**

Adelong Gamer



- 512MB DDR RAM
- 60GB 7200RPM Hard Drive
- 1.44Mb Floppy Drive
- 128MB GeForce 4 TI4200
- 17" Monitor
- 16X DVD-ROM
- Creative SoundBlaster DE 5.1
- Creative Inspire 5300 Speakers (5.1 Satellite and Subwoofer)
- ATX Midtower Case
- MS Internet Keyboard,
- 56K Internal Modem
- Optical Mouse
- MS Windows XP Home Edition



Please see page 2 for options and add ons.

XP 2100 + AMD Athlon™ Processor **\$2279**

SYNDR033

2.4Ghz Intel Pentium 4™ Processor **\$2399**

SYNDR034

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AMD SOHO Upgrade

- Gigabyte GA-7VMXL or GA-7VMXLs
- Integrated Video
- Integrated AC-97 Audio
- Integrated 10/100 Ethernet
- Adelong Mini Atx case 250W

1.2GHz Duron™ Processor **\$299** SPADCE23
 1.3GHz Duron™ Processor **\$315** SPADCE24
 Athlon XP1800+™ Processor **\$355** SPADCE25
 Athlon XP2000+™ Processor **\$399** SPADCE26

Intel SOHO Upgrade

- GA-85KML Allinone
- Integrated Video
- Integrated AC-97 Audio
- Integrated 10/100 Ethernet
- Adelong Mini Atx case 250W

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 1.8GHz Celeron™ Processor **\$345** SPADCE27
 P4-1.8GHz Processor **\$495** SPADCE28
 With P4-2.0GHz Processor **\$545** SPADCE28



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Intel Gamer Upgrade

- Leadtek AT070H 64MB GeForce 4
- GA-7VA or GA-85T67
- Integrated AC-97 Audio
- Liteon 48x12x48 CDRW
- Adelong 9001 ATX case 300W

AMD Athlon™ XP 2000+ **\$745** SPADCE27
 AMD Athlon™ Processor XP 2200+ **\$879** SPADCE28
 Intel Celeron™ Processor 1.8GHz **\$695** SPADCE29
 Intel P4™ Processor 2.0GHz **\$845** SPADCE29
 Intel P4™ Processor 2.4GHz **\$895** SPADCE29

Laptop

Satellite 110

- Intel Celeron 1.5GHz
- 14.1" XGA (1024 x 768)
- 128MB PC2100 DDR SDRAM
- 16MB ATI Mobility Radeon
- Internal DVD drive, 3.5" FDD
- 20GB Hard drive
- PCMCIA Type III
- SVHS out, 3 USB ports
- V90 56K
- Windows XP Home



\$2475 NB10510

Satellite 1410

- Intel Celeron 1.8GHz
- 14.1" XGA (1024 x 768)
- 256MB PC2100 DDR SDRAM
- 16MB nVidia® GeForce™ 420Go
- Int. DVD/CDRW drive, 3.5" FDD
- 20GB Hard drive
- PCMCIA Type III
- SVHS out, 3 USB ports
- V90 56K
- Windows XP Home



\$2975 NB10511

Satellite 2410

- Intel Pentium 4 1.7GHz
- 14.1" XGA (1024 x 768)
- 256MB PC2100 DDR SDRAM
- 16MB nVidia® GeForce™ 420Go
- Int. DVD/CDRW drive, 3.5" FDD
- 30GB Hard drive
- SVHS out, PCMCIA Type III
- SVHS out, 3 USB ports, Firewire
- Integrated 10/100, V90 56K
- Windows XP Pro

\$3475 NB10512

PDA - Palm

Palm Zire

The Zire handheld offers the style and ease of Palm, the leading handheld brand at a price that appeals to everyone. It couldn't be easier to stay organised. Keep the information that is most important to you.

- Dragonball EZ Processor 16MHz
- 2MB of RAM & 4MB Rom
- 112(H) mm x 74(W) mm x 16(D) mm
- 160/160 pixel TFT with backlight
- Lithium Batt. and Charger
- Infra Red port

\$239 NEPAL000

Palm Tungsten

Introducing the Palm Tungsten™ T handheld, Palm's most compact handheld ever, featuring a powerful OMAP™ processor (an enhanced ARM-based processor), a voice recorder, 5-way navigation, built-in Bluetooth and an ultra-sharp colour screen.

- Texas Instruments OMAP1510 processor
- 16MB SDRAM (14MB actual storage capacity)
- 102(H) mm x 77(W) mm x 15(D) mm
- 320x320 pixel 65,536 colour TFT with backlight
- SD/MMC Memory Slot
- Infra Red port and Bluetooth
- MP3 Audio, Voice recording

\$Call NEPAL001

PDA - Pocket PC

Toshiba e310

- Intel Strongarm 206MHz Processor
- 32MB of RAM & 32MB Rom
- 125(H) mm x 79(W) mm x 12.4(D) mm
- 65,536 colour TFT
- In built Speaker & Stereo headphone socket
- SD Card Slot
- Infra Red port

\$845 NB10516



Acer N25

- Intel PXA250 400MHz Xscale
- 64MB of RAM & 32MB Rom
- 129(H) mm x 79(W) mm x 12(D) mm
- 320x320 pixel 65,536 colour TFT with backlight
- In built Speaker & Stereo headphone socket
- Memory Stick Slot
- Infra Red port

\$995 NBACE016



Compact Ipaq 3970

- Intel PXA250 400MHz Xscale
- 64MB of RAM & 48MB Rom
- 320x320 pixel 65,536 colour TFT with backlight
- In built Speaker & Stereo headphone socket
- Internal Microphone & record button
- SD Card Slot
- Infra Red port

\$1375 NB105143



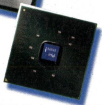
Intel® CPU

Pentium 4™ Socket 478 Processors

Pentium 4™ Processor 1.8GHz 400MHz FSB	\$315 CPW1002
Pentium 4™ Processor 2GHz 400MHz FSB	\$355 CPW1003
Pentium 4™ Processor 2.4GHz 533MHz FSB	\$425 CPW1009
Pentium 4™ Processor 2.53GHz 533MHz FSB	\$525 CPW1000
Pentium 4™ Processor 2.66GHz 533MHz FSB	\$845 CPW1001
Pentium 4™ Processor 2.80GHz 533MHz FSB	\$989 CPW1002
Pentium 4™ Processor 3.0GHz 533MHz FSB	Scall CPW1003

Celeron™ Socket 478 Processors

1.7GHz Celeron™ Processor	\$159 CPW1096
1.8GHz Celeron™ Processor	\$199 CPW1098
2.0GHz Celeron™ Processor	\$239 CPW1004



AMD CPU

AMD Athlon™ MP Processors

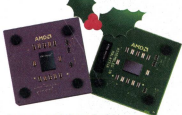
AMD Athlon™ MP 1800+ Processor	\$325 CPMD063
AMD Athlon™ MP 1900+ Processor	\$355 CPMD068
AMD Athlon™ MP 2000+ Processor	\$375 CPMD071
AMD Athlon™ MP 2100+ Processor	\$425 CPMD072
AMD Athlon™ MP 2200+ Processor	\$495 CPMD077

AMD Athlon™ XP Processors

AMD Athlon™ XP 1800+ Processor	\$189 CPMD060
AMD Athlon™ XP 1900+ Processor	\$225 CPMD065
AMD Athlon™ XP 2000+ Processor	\$235 CPMD067
AMD Athlon™ XP 2100+ Processor	\$309 CPMD070
AMD Athlon™ XP 2200+ Processor	\$355 CPMD073
AMD Athlon™ XP 2400+ Processor	\$399 CPMD074
AMD Athlon™ XP 2600+ Processor	\$495 CPMD075

AMD Duron™ Processors

1.2GHz Duron™ Processor	\$109 CPMD096
1.3GHz Duron™ Processor	\$129 CPMD098



New Processors Coming SOON! Visit our website www.adelong.com.au, for the latest pricing information

Motherboard

AMD Athlon Boards

Gigabyte GA-7VA

- AMD Socket A CPU Athlon/Duron (200/266/333)
- VIA Apollo KT400 Chipset
- 3 184 pin DDR Ram Slots
- Up to 3GB DDR200/266/333/400
- 1 x AGP (BX/4X), 5 x PCI
- Integrated Audio
- 2 x UDMA 100/66/33 IDE Controllers
- 2 x USB 2.0 Ports (4 USB Ports Front Panel)
- ATX Form Factor



\$195 MBG1607

Gigabyte GA-7VKML

- AMD Socket A CPU Athlon/Duron (200/266/333)
- VIA Apollo KT400 Chipset
- 3 184 pin DDR Ram Slots
- Up to 3GB DDR200/266/333/400
- 1 x AGP (BX/4X), 5 x PCI
- Integrated Audio
- 2 x UDMA 100/66/33 IDE Controllers
- 2 x USB 2.0 Ports (4 USB Ports Front Panel)
- ATX Form Factor



\$145 MBG1607

TYAN Dual S2460

- Supports Dual AMD MP Processors
- 4 x 184 pin DDR Sockets (Max 3GB)
- 4 x 64bit PCI, 2 x 32bit PCI, 1 x AGP
- 2 x UDMA 133/100/66 IDE Controllers
- 2 x USB Ports
- ATX Form Factor

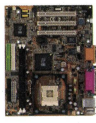


\$425 MBG16100

Value Pentium 4 Boards

Gigabyte GA-8SKML

- Supports Intel Pentium 4 Slot 478
- SIS 648 Chipset
- 2 184 pin DDR Sockets (200/266)
- 2 168 pin SDRAM Sockets to 2GB (PC133/100)
- Integrated Graphics Adapter
- Integrated 10/100 LAN
- Integrated Audio (AC97)
- 3 x PCI Slots
- 2 x UDMA 100/66 IDE Controllers
- ATX Form Factor



\$155 MBG16082

Gigabyte GA-8SG667

- Supports Intel Pentium 4 (FSB533/400)
- SIS 648 Chipset
- 3 x 184 pin DDR Sockets (Max 3GB)
- 1 x AGP 5 x PCI
- 2 x UDMA 133/100/66 IDE Controllers
- 5.1 channel Audio with SPDIF
- 2 x USB 2.0 Ports
- ATX Form Factor



\$195 MBG16077

Gigabyte GA-8E533

- Supports Intel Pentium 4 (FSB533/400)
- Intel 845 Chipset
- 3 x 184 pin DDR 200/266 Sockets (Max 2GB)
- 1 x AGP 5 x PCI
- 2 x UDMA 100/66 IDE Controllers
- Integrated AC97 Audio
- 2 x USB 2.0 Ports
- ATX Form Factor

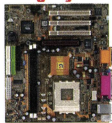


\$195 MBG16089

Performance Pentium 4 Boards

Gigabyte GA-8PE667 Pro

- Supports Intel Pentium 4 with HT Technology
- Intel 845PE Performance Chipset
- 3 x 184 pin DDR 266/333 Sockets (Max 2GB)
- 1 x AGP 6 x PCI
- 2 x UDMA 100/66 IDE Controllers
- 5.1 channel Audio with SPDIF
- Onboard Intel Pro 10/100 LAN
- 2 x USB 2.0 Ports
- (8 Ports with rear USB bracket)
- ATX Form Factor



\$275 MBG16100

Exclusively with Gigabyte GA-8PE667 Pro/Ultra Mainboards



Provides a performance boost on multi-threading and multi-tasking operations for the Intel® NetBurst™ microarchitecture.



Gigabyte GA-8PE667 Ultra

- Supports Intel Pentium 4 with HT Technology
- Intel 845PE Performance Chipset
- 3 x 184 pin DDR 200/266/333
- 1 x AGP 6 x PCI
- 2 x ATA 133/100 IDE with RAID
- 2 x UDMA 100/66 IDE Controllers
- 5.1 channel Audio with SPDIF
- Onboard Intel Pro 10/100 LAN
- 2 x USB 2.0 Ports
- (8 Ports with rear USB bracket)
- ATX Form Factor



\$325 MBG161079

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PC Games



Age of Empires 2: Gold Edition

This pack brings you the exciting game play of both Age of Empires 2: The Age of Kings and Age of Empires2: The Conquerors Expansion plus additional content for one compelling gaming experience.

\$55 SWMST03



Unreal Tournament 2003

The sequel to 1999's game of the year, Unreal brings you to a merciless arena of the future, where elite warriors rely on speed, strategy and awesome firepower to be the ultimate champion.

\$95 SWGAM00



Warcraft 3

Play one of 4 races to vie for dominance of a mystical land. Brilliant 3-dimensional graphics and excellent gameplay make Warcraft 3 one of the hottest games of the year.

\$95 SWGAM01

Need for Speed: Hot Pursuit 2

Feel the rush of flying down the open road in a Ferrari, Porsche, or some other exclusive automobile re-created in loving tribute. The game play is fast and furious, with simulated speeds of 170 mph (running 60 frames per second) through realistic traffic situations.



\$75 SWGAM02



Battlefield 1942

In Battlefield 1942, you're a WWII soldier on a true-to-life battlefield, equipped with weapons that look and sound authentic, able to storm the beaches on foot or seamlessly jump into and out of any of 35 vehicles of war.

\$95 SWGAM03

Gaming and Input Devices



SideWinder GamePad

Microsoft's definitive game pad sets the standard for enhanced game play. USB connection means instant plug and play setup. Optimized layout and an innovative design provide ultimate comfort and seamless integration with sports, action, and racing games.

\$45 WMS050



SideWinder Strategic Commander

Get ready for a revolution in strategy gaming. Bring your strategy game play to a new level by allowing you to move, deploy and command your forces faster and more efficiently. Its innovative map movement control lets you scroll and spin the map quickly.

\$65 WMS051



SideWinder Precision Wheel

The SideWinder Precision Racing Wheel is a complete driving system including a compact yet rugged state-of-the-art PC steering wheel. The wheel includes an easy-to-release clamp for quick attaching and removing, sturdy nonslip pedals, and 8 buttons, including 2 shifters-triggers

SideWinder Precision Wheel **\$109** WMS052



SideWinder Precision 2

In a wild, hair-raising dogfight, precision and control are critical. That's why the SideWinder® Precision 2 has been reengineered for even more accuracy. With its nimble rudder twist, Microsoft 3 year warranty, and an improved throttle, this professional quality stick feels as great as it performs.

\$85 WMS053

with MS Flight Simulator 2002 Set **\$129** WMS054



Microsoft Optical Blue Mouse

Turn any desktop into a bright, vibrant space with the Microsoft Optical Mouse Blue. It offers a fun design with a wider, one-of-a-kind, clear scroll wheel and a signature red optical glow.

\$55 WMS055

Wireless Optical Blue Mouse **\$89** WMS056



Microsoft Multimedia Keyboard

Maximise your digital experience and have 1-button access to navigate music, the Internet, videos and programs you access frequently.

\$75 WMS057

MS Internet Keyboard **\$49** WMS058

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128MB PC2100 DDR SDRAM \$75 RAGEN040
256MB PC2100 DDR SDRAM \$165 RAGEN041
512MB PC2100 DDR SDRAM \$295 RAGEN052
256MB PC2700 DDR SDRAM \$179 RAGEN053
512MB PC2700 DDR SDRAM \$295 RAGEN062
256MB PC3200 DDR SDRAM \$341 RAGEN067
512MB PC3200 DDR SDRAM \$341 RAGEN068



RAMBUS RAM

128MB 800MHz Rambus RIMM \$135 RAGEN004
256MB 800MHz Rambus RIMM \$245 RAGEN007
128MB PC133 SDRAM \$95 RAGEN030
256MB PC133 SDRAM \$88 RAGEN031
512MB PC133 SDRAM \$209 RAGEN041



Notebook SODIMM

128MB PC-133 SODIMM \$99 RAGEN054
256MB PC-133 SODIMM \$195 RAGEN053
128MB DDR SODIMM \$119 RAGEN095
256MB DDR SODIMM \$239 RAGEN066



Flash Memory

SmartMedia

64MB \$88 RAGEN069
128MB \$135 RAGEN070



MultiMedia

64MB \$99 RAGEN075
128MB \$175 RAGEN075



SecureDigital

64MB \$165 RAGEN074
128MB \$225 RAGEN071



Compact Flash Memory

64MB \$79 RAGEN056
128MB \$125 RAGEN058
256MB \$215 RAGEN060



Memory Stick

64MB \$99 RAGEN072
128MB \$175 RAGEN073



USB Flash

64MB \$99 RAGEN072
128MB \$145 RAGEN073
256MB \$215 RAGEN074



Video Cards

LeadTek A250 MyViVO



- NVIDIA GeForce 4 Ti4600 Processor
- DVI & TV Out
- 64/128MB DDR RAM
- Dual Programmable Vertex Shaders
- MPEG 1/2 Analog Video Capture
- Supports De-Interlaced Video
- Supports Picture In Picture Playback

\$575 D05E025

A250 Ti4200 TD-64MB \$299 D05E023
A250 Ti4200-128MB \$355 D05E026

Nvidia Geforce

Leadtek A180

- NVIDIA Geforce 4 MX 440 GPU
- 64MB DDR Memory
- 8.0 GB/sec Memory Bandwidth
- AGP 8X/4X/2X and AGP Texturing Support
- 34M triangles/sec through T&L and Set-up
- 1.1 billion texels Fill Rate
- Microsoft® DirectX® 8.1X and OpenGL® 1.3 Support
- 2 dual-rendering pipelines
- TV out



\$225 D05E028
A170 64MB MX440 TH \$199 D05E030
A170T 64MB MX440 \$165 D05E034

nVidia Geforce4 MX 460



- NVIDIA Geforce 4 MX 460 Processor
- 64MB DDR RAM
- TV Out
- 8.8GB/sec Memory Bandwidth
- 38 Million Triangles per Second
- 1.2 Billion Texels per Second

\$179 D05E032

nVidia Geforce 4 MX 440 \$165 D05E029
nVidia Geforce 2 MX 400 \$99 D05E022

ATI Radeon

ATI Radeon 8500 64M DDR TV DVI



- Radeon 8500E GPU
- 250MHz core attached to 64MB onboard DDR RAM
- Triple VGA/Dual DVI/TV Out
- Fully DirectX® 8.1 & OpenGL® 1.3 compliant

\$275 D05G003

Gigabyte R9700PRO

- New SMARTSHADER™ 2.0, MOOTHVISION™ 2.0 and VIDEOCHARGER™ technology
- First to fully support DirectX® 9.0 and the latest OpenGL
- Radeon 9700 GPU
- 256-bit DDR Memory Interface
- Triple VGA/Dual DVI/TV Out
- 128MB DDR Memory
- AGP 8x (2.0GB/sec)
- Bundle Software



\$795 D05G004

Gigabyte AV65DG-E



- Radeon 9000 GPU
- 128-bit DDR Memory Interface
- VGA and TV Outputs
- 64MB DDR Memory
- DirectX® 8.1
- AGP 4x

\$175 D05G005
Gigabyte AV65DG-H (9000PRO) \$239 D05G004

Digital Cards

Pinnacle PCTV Pro

- Real Time MPEG1, MPEG2, DV - software compression
- FM tuner with Real Time Audio Compression
- Time-shifting feature lets you pause or replay while recording a live show
- Pinnacle 1-File multimedia file converter
- Pinnacle Studio 7 video editing software (TRIAL version)
- Infrared Remote Control (batteries included)
- Still image capture



\$239 MAMP001

Pinnacle PCTV \$129 MAMP010

Pinnacle Studio DV Plus

- Capture and edit DVD Quality MPEG video from DV or Digital camcorders
- Advanced preview window shows your edits immediately
- More than 100 scene transitions and Hollywood FX 3D transitions
- Title/Slide for title effects including drop shadows and neon glows
- Custom audio features let you sync sound effects perfectly
- Intelligent Rendering renders only the effects.
- Import mp3 files or rip directly from CD for background music



\$489 MAMP002

Pinnacle Studio DV \$345 MAMP010

Liferview Video 3000



- Watch TV on PC: 125-channel available, cable/air, TV, analog TV tuner with teletext.
- Demodulate stereo TV sound
- External input sources through Hi or S-Video connector.
- Motion video capture saved as MPEG1 format up to 30 fps and single frame snapshot.
- Time-Shifting: The Time-Shifting feature ensures instant replay.
- Tuner Modules support all TV standards.
- Wireless Remote Control
- FM Radio

\$99 MAMP011

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Hard Drives



Barracuda

- Ultra ATA/100
- 8.9ms Seek Time
- 7200 RPM

40GB **\$165** HEGSGT057

60GB **\$195** HEGSGT067

80GB **\$219** HEGSGT068

Cheetah

- Ultra160 SCSI
- 5.1ms Seek
- 10000 RPM

18GB **\$395** HEGSGT060

36GB **\$599** HEGSGT061

73GB **\$1195** HEGSGT062



DiamondMax

- Ultra ATA100
- 5400 RPM

120GB **\$325** HEMAXD25

160GB **\$515** HEMAXD26

DiamondMax

- Ultra ATA133
- 7200 RPM

40GB **\$169** HEMAXD18

60GB **\$209** HEMAXD19

80GB **\$229** HEMAXD20

Notebook Hard Drives

- 9mm 2.5" Hard Drive
- ATA-100 IDE Interface
- 4200 RPM
- Compatible with most Notebooks

10GB **\$175** HEMHT005

20GB **\$205** HEMHT008

30GB **\$255** HEMHT010

40GB **\$325** HEMHT011



CD/DVD/CDRW

Adelong External Optical Drives

FireWire USB 2*

PC & Mac**
Compatible

32x10x40x

\$249 MMADE002

\$245 MMADE009

40x12x48x

\$275 MMADE003

\$279 MMADE010

DVD-R/RW

\$755 MMADE007

\$749 MMADE011



*USB 2.0 CD-ROM Drives are backwards compatible with USB 1.1 ports, however, read/write speeds will be limited by USB 1.1 specifications.
**Mac Compatible refers to the external drive only. Macintosh-compatible burning software is not included.

16 x DVD-Rom



\$89 MMA1T003

- 16 x DVD-Rom/40 X CD-Rom Drive
- ATA-66 IDE Interface
- Includes DVD Playback Software

LG DVD/CDRW Combo

- IDE Interface
- 16 x DVD Reader
- 32 x Write/10 x Re-Write/40 x Read
- Buffer Under-run Protection
- Include CD recording and DVD playback



\$195 MMA1C007

Yamaha CRW-F1

Fastest CD-R Burner

- 48X Write / 24X Rewrite / 44X Read
- Suburban 8MB Buffer
- T@2 (tattoo) technology allows text & logos to be burned onto the disc data side
- Includes Nero 5.5 & InCD for Windows



Internal IDE

\$255 MMA1C005

External USB 2.0

\$445 MMA1C007

External Firewire

\$545 MMA1C008

LiteOn CDRW



- 48X Write/ 24X Rewrite
- 48X Read
- EIDE Interface
- Buffer under-run protection
- Includes CD burn software

\$125 MMA1T001

TDK VeloCD 40x12x48x

- IDE Interface
- 40 x Write/12 x Re-Write/48 x Read
- 48X digital audio extraction
- Buffer Under-run Protection
- Include CD recording software
- Burn a full CD in under 3 minutes



\$179 MMA1C000

Liteon 40X/12X/40X External USB CDRW



- 40X Write, 12X Rewrite, 40X Read
- High Speed Digital Extraction
- Portable Innovative design
- External USB 2.0

\$299 MMA1T007

Pioneer DVR-A05 DVD-R/RW Writer

- Features:
- 4X DVD-R Write, 2X DVD-RW
 - 16X CD-R, 8X CDRW
 - Bundled DVD authoring and video editing software
 - Includes 1 x DVD-R & DVD-RW Media



\$695 MMA1C004

DVD/CD Media



Verbatim DVD-R **\$9** MMA1C036

Verbatim DVD-RW **\$12** MMA1C037

Verbatim DVD-R + R **\$10** MMA1C038

Verbatim DVD-R **\$12** MMA1C039



10 Pack 80Min CD-R **\$15** MMA1C029

50 Pack 80Min CD-R **\$39** MMA1C030

5 Pack 700MB CD-R **\$9** MMA1C031

Panasonic

Panasonic LF-D321E + UJDD410 Bundle



Make DVD-Rs, backup data using DVD-RAM and have a dedicated CDRW as well. This is the ultimate optical storage configuration. Amazing value in this special offer, the kit includes blank media, all cables required, software for both DVD and CD creation and the excellent Panasonic Drives.

\$799
\$745

TX-LCD15S

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 16.7 Million Colours
- 1-Touch AutoAdjust
- 5-Language OSD
- Stereo Speakers
- 340 degree Swivel Base

\$799


TX-LCD17S

- 17" Colour LCD
- 17" Viewable (Diagonal)
- Up To 1280 x 1024
- 16.7 Million Colours
- 1-Touch AutoAdjust
- 5-Language OSD
- Stereo Speakers
- 340 degree Swivel Base

\$1399

CW-8572 DVD/CDRW Combo



- 16x Write, 10x Re-Write, 48x CD read, 12x DVD Read
- DVD-RAM, DVD-R Compatible
- E-IDE (ATAPI 4) Interface
- Digital Audio Out Connection
- Horizontal or Vertical Mounting

\$235

Monitors

NEC LCD1550V

No Touch Auto Adjust adjusts the monitor to optimal settings upon initial power-on, low energy consumption reduces costs over the monitor's life.

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 300:1 contrast ratio
- 16.7 Million Colours
- PC & Mac Compatible

\$795

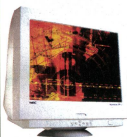

NEC LCD1700V

- 17" Colour LCD
- 17" Viewable (Diagonal)
- Up To 1280 x 1024
- 300:1 contrast ratio
- 16.7 Million Colours
- PC & Mac Compatible

\$1299


NEC FP1355 22"

he ultimate in screen performance with the 22" MultiSync FP1355 CRT. This monitor's flat screen virtually eliminates glare and distortion, while providing excellent sharpness and brightness.



- 22" MultiSync CRT
- 20" Viewable (Diagonal)
- Up To 2048 x 1536 @ 75 Hz
- 16.7 Million Colours (s-RGB)
- PC & Mac Compatible
- 495(W) mm x 643(H) mm x 632(D) mm
- Weighs 29.7kg

\$1495

Philips 17" Display 107T

- 16" Viewable
- 0.25mm Dot Pitch
- Up To 1280 x 1024 @ 64Hz
- 410(H) x 395(W) x 419(D)mm
- Xtra Space Design
- 15-pin Mini D-Sub Connector
- Weighs 16.5kg

\$305


Philips 19" Display 109B

- 18" Viewable
- 0.25mm Grille Pitch
- Up To 1920 x 1440 @ 60Hz
- 1280 x 1024 @ 85Hz
- 469(H) x 456(W) x 438(D)mm
- 15-pin Mini D-Sub Connector
- Weighs 23.5kg

\$595


Phillips 21" Display 202P

- 20" Viewable
- 0.21mm Grille Pitch
- Up To 1990 x 1440 @ 60Hz
- 1600 x 1200 @ 86Hz
- 501(H) x 801(W) x 466(D)mm
- 15-pin Mini D-Sub Connector
- 5 BNC Video Connectors
- Weighs 29kg

\$1650


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* within 50km of service centre

Mitsubishi Diamond DPro 730

- 17" Picture Tube
- 16" Viewable Diagonal Screen Size
- 0.25mm Phosphor Stripe Pitch
- Up To 1600 x 1200 @ 75Hz
- PC & Mac Compatible
- 413(H) x 399(W) x 415(D)mm
- Weighs 19kg



\$519 MMMT020

Mitsubishi Diamond View 1998E

- 19" Picture Tube
- 18" Viewable Diagonal Screen Size
- 0.25mm Dot Pitch
- Up To 1600 x 1200 @ 75Hz
- PC & Mac Compatible
- 455(H) x 476(W) x 463(D)mm
- Weighs 19kg



\$455 MMMT029

Diamond View 1770H (17" CRT) \$275 MMMT026

Mitsubishi DP 2060u

- 22" DiamondForm NF Natural Flat Picture Tube
- 21" Viewable Diagonal Screen Size
- 0.21mm Aperture Grille Pitch
- Up To 2048 x 1536 @ 60Hz
- PC & Mac Compatible
- 450(H) x 495(W) x 473(D)mm
- Weighs 29.7kg



\$1999 MMMT030

Mitsubishi Diamond CDRW



- EIDE Interface
- Buffer Under-run Protection
- Includes Nero Burn Software

48X Write/ 48X Read/ 16 X ReWrite

\$135 MMMT022

48X Write/ 40X Read/ 12 X ReWrite

\$120 MMMT021

Mitsubishi DV153 15" LCD

Available In Beige Or Black

- 15" Colour LCD
- 15" Viewable (Diagonal)
- Up To 1024 x 768
- 16.7 Million Colours
- PC & Mac Compatible
- 380(W) mm x 363(H) mm x 186(D) mm
- Weighs 4.7kg



\$795 MMMT031

Canon Printers / Scanners

Canon S100SP

- 720 x 360 dpi Print Resolution
- Up to 5 Pages Per Minute
- Banner & Poster Printing
- PC & Mac Compatible
- USB Interface



\$105 PCCAN050

Canon 200SP

- 2880 x 1720 dpi Print Resolution
- Up to 5 Pages Per Minute
- Up to 3 Colour PPM
- PC & Mac Compatible
- USB Interface



\$145 PCCAN049

Canon S300

- 2400 x 1200 dpi Print Resolution
- Up to 11 Pages Per Minute
- Up to 7.5 Colour PPM
- PC & Mac Compatible
- USB Interface



\$189 PCCAN048

Canon S520

- Up to 14 Black & White/3 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Full-Bleed Printing Up To A4
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



\$355 PCCAN050

(When Using Canon's Photo Print Pro)

Canon 750

- Up to 20 Black & White/3 Colour Pages Per Minute
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Full-Bleed Printing Up To A4
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



\$425 PCCAN052

Canon S830D

- Up to 4 Black & White/4 Colour Pages Per Minute
- Bubble Jet Direct Memory Card Printing
- Colourfast for up to 25 Years*
- 2400 x 1200 dpi Print Resolution
- Borderless Printing Up To A4
- USB & Parallel Interfaces
- PC & Mac Compatible
- Individual Ink tanks



\$845 PCCAN054

Canon D646Uex

This stylish and compact unit is easy to set up with a Mac or PC to produce outstanding 600 x 1200 dpi resolution images.

- Powerful Imaging and OCR software* 600 x 1200 dpi
- 48-bit input and 24-bit output
- Connect to Mac or PC
- Advanced 2-Lid
- USB Interface



\$165 10CAN027

Canoscan 1250U2

Designed for ease of use and quality scanning, the Canoscan 1250U2 has three built-in scan buttons, for easy operation with tasks such as scan, copy and email.

- 1200 x 2400 dpi Optical Resolution
- 48-bit input and 24-bit output
- Advanced 2-Lid for scanning of bulky items
- Fast USB 2.0 Interface



\$219 10CAN025

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Epson Printers

Epson Stylus C41UX

- Up to 12 Black & White/5.4 Colour ppm
- 1440 dpi Print Resolution
- USB Interface
- PC & Mac Compatible

**\$115** PREP5044

Epson Stylus C61

- Up to 14 Black & White/4 Colour ppm
- 5760 x 720 dpi Print Resolution
- USB and Parallel Interface
- PC & Mac Compatible

**\$219** PREP5049

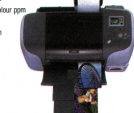
Epson Stylus Photo 830

- Up to 14 Black & White/3.1 Colour ppm
- Colourfast for up to 25 Years*
- 5760 x 720 dpi Print Resolution
- Borderless Printing Up To A4
- USB and Parallel Interface
- PC & Mac Compatible
- 6 Individual Ink tanks

**\$359** PREP5055

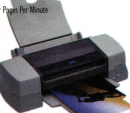
Epson Stylus Photo 925

- Up to 8.5 Black & White/8.5 Colour ppm
- Colourfast for up to 25 Years*
- 5760 x 720 dpi Print Resolution
- Borderless Printing Up To A4
- Memory Card Printing
- USB Interface
- PC & Mac Compatible
- 6 Individual Ink tanks

**\$745** PREP5056

Epson Stylus Photo 1290

- Up to 9.4 Black & White/9 Colour Ppm Per Minute
- Colourfast for up to 25 Years*
- 2880 x 720 dpi Print Resolution
- Borderless Printing Up To A3
- USB & Parallel Interfaces
- PC & Mac Compatible
- 6 Individual Ink tanks

**\$975** PREP5054

Epson Stylus Photo 2100

- Up to 7.5 Black & White/7.5 Colour ppm
- Colourfast for up to 45 Years*
- 2880 x 720 dpi Print Resolution
- Borderless Printing Up To A3+
- Direct Printing onto CDs
- Roll Paper support and Auto Cutter
- USB 2.0, Firewire and Parallel Interface
- PC & Mac Compatible
- 7 Individual Ink tanks

**\$1795** PREP5057

Epson 1260

The combination of powerful features, size-of-use, high quality and affordability of the Epson 1260 Photo has taken home scanning to new levels. High speed document and photo scanning

- Transparency Unit for 35mm film negatives/slides
- Up to 1200 dpi (2400 dpi sub-scan)
- Single button operation and full auto mode
- Bundled with photo editing, OCR

**\$220** IOP5011

Epson 2400

High speed and high resolution film scanning performance for the demanding user, the EPSON Perfection 2400 Photo delivers exceptional performance for every scanning need.

- Integrated Transparency Unit for 35mm slides and films
- High resolution - 2400 dpi (4800 dpi sub-scan)
- Bundled with Adobe Photoshop Elements, OCR
- On-board high-speed ASIC processor
- USB 2.0 High speed interface

**\$479** IOP5012

Hp Printers / Scanners

Hp Deskjet 3420

- 2400 x 1200 dpi Print Resolution
- Up to 10 Black & White/8 Colour ppm
- Banner & Poster Printing
- PC & Mac Compatible
- USB Interface

**\$145** PREP0002

Hp Deskjet 3820

- 4800 x 1200 dpi Print Resolution
- Up to 12 Black & White/10 Colour ppm
- Manual two sided printing
- PC & Mac Compatible
- USB and Parallel Interface

**\$189** PREP0113

Hp Deskjet 5550

- Up to 17 Black & White/12 Colour ppm
- 4800 x 1200 dpi print resolution
- automatically detects paper type and adjusts print settings
- USB and Parallel Interface
- PC & Mac Compatible

**\$279** PREP0115

HP LaserJet 1000

The personal desktop laser all-in-one that is ideal for the home office, small business

- Up to 15ppm Black & White
- 1200 dpi Print Resolution
- USB & Parallel Interfaces
- PC & Mac Compatible

**\$675** PREP0121

HP LaserJet 2200

A reliable office laser printer, the HP LaserJet 2200 series is essential for business professionals who are looking for consistent laser print quality with good productivity and versatility at an affordable price.

- Up to 18ppm Black & White
- 1200 dpi Print Resolution
- Parallel Port, LocalTalk
- Optional Network interface
- PC & Mac Compatible

**\$1469** PREP0118

OfficeJet V40

A sheetfed, multi-function business tool that delivers photo-quality printing, faxing, scanning and copying - all in colour, right at your desktop.

- High-speed printing/copying (8ppm black, 7 ppm colour)
- 2400 x 1200 dpi print resolution
- 20 page Automatic Doc. Feeder
- Stand-alone & PC Fax

**\$475** PREP0108

PSC 750

Super Value compact and complete printer, scanner and copier from HP. Easy to scan and copy a wide variety of documents, even 3-D objects with flatbed copier/scanner

- High-speed printing/copying (11ppm black, 8.5 ppm colour)
- Flatbed 3600 colour scanning
- 2400 x 1200 dpi print resolution
- PC & Mac Compatible
- USB Interface

**\$375** PREP0122

PSC 2110

HP's versatile small and home office all-in-one printer, flatbed scanner, and copier with up to 4800 dpi, HP PhotoREt 4 and borderless photo printing

- High-speed printing/copying (14ppm black, 10 ppm colour)
- Flatbed 3600 colour scanning
- 2400 x 1200 dpi print resolution
- PC & Mac Compatible
- USB Interface

**\$545** PREP0123

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Hope Christmas brings your FAVORITE things!

Adelong Computers



Digital Cameras

Please see page 6 for memory cards

Canon PowerShot S200

The PowerShot S200 is the perfect entry level digital still camera, merging many of the same capabilities and features as high-end digital cameras with the benefits of economy and ease of use. Combining a high resolution 2.0 Megapixel CCD, 12.8 fixed Canon lens, auto focus and photo effect modes in a sleek, pocketsize body

- 2.0 Megapixel digital camera
- Canon fixed-focus lens, auto focus, 5mm (2.8 lens)
- Easy image transfer, photo printing, PC/TV display
- Movie recording/playback @320 x 240 pixels, 15 fps
- 8MB Compact Flash Card
- Use of widely available and cost-effective AA batteries.

\$369 (OCAN029)



Sony CyberShot U10

It's not until you've held Sony's Cyber-shot U in the palm of your hand that you realize just how small it is: weighing in at a mere 87 grams.

- 1.2 Effective Mega Pixel Super HAD CCD
- Focal Length: 35mm
- Multi Point and Centre Weighted Auto Focus
- MPEG Movie recording/playback
- Connection to your PC via USB
- 2 x AAA rechargeable batteries
- Battery charger
- 8MB Memory Stick
- Neck Strap

\$489 (OSON012)



Panasonic Lumix DMC-F7

Lumix™ digital cameras are equipped with world-renowned Leica D lenses to offer you the ultimate in digital photography.

- 2.0 MegaPixel CCD records 1600x 1200 in large file mode
- movie recording/playback @320 x 240 pixels, 15 fps
- 2 x optical Leica lens
- 8MB Secure Digital Card
- Li-Ion battery and battery charger
- Software for Mac and PC

\$875 (OPAN070)



Canon Digital Ixus V3

The PowerShot Digital Ixus V3 delivers high quality, sharp photos with every shot no matter what the setting.

- Finish stainless steel body weighing a tiny 180g
- 3.2 MegaPixel CCD records 2048 x 1536 pixels in large file mode
- 9-point AF focusing and evaluative exposure
- movie recording/playback @640 x 480 pixels, 15 fps
- 2 x optical zoom, 5 x digital zoom
- 8MB Compact Flash Card
- Li-Ion battery and battery charger
- Software for Mac and PC

\$975 (OCAN030)



Sony DSC-P51

The perfect balance between performance, price and features. The CyberShot P51 is ideal for the first time digital camera user.

- 2.1 Effective Mega Pixel Super HAD CCD
- Focal Length: 41 - 82mm
- Evaluative, spot metering
- MPEG Movie recording/playback
- Connection to your PC via USB
- Li-Ion battery/battery charger
- 16MB Memory Stick
- Neck Strap

\$625 (OSON013)



DSC P71 3.2 megapixels

\$945 (OSON014)

Casio Exilim M2

Advanced CASIO technology brings you digital imaging at its thinnest! A bright, clear TFT LCD monitor screen, plus powerful image recording features and functions in a trim package that measures 11.3 millimeters thin and weighs a mere 85 grams.

- 2 Mega Pixel CCD (1600x1200)
- Focal Length 35mm
- As Digital Zoom
- LCD Remote control headphones
- MPEG Movie recording/playback
- Mp3 playback and voice recording
- Connection to your PC via USB
- Li-Ion battery/battery charger
- 12MB Built in Memory + SD/MMC Slot

\$789 (MCA2S01)



Exilim S2 (no MP3 ability) \$689 (MCA2S02)

Web Cams

Logitech Quickcam Express

Now you can meet face-to-face online with live video calls. Or make your instant messages come alive by adding live video. All you need is QuickCam® Express and the Internet.

- Snap button for instant pictures
- Video resolutions up to 640 x 480
- Still Images up to 640 x 480
- USB Interface

\$75 (LOQ202)



Logitech Quickcam Zoom

Zoom in on life and get closer to what's important. With a digital zoom, built-in microphone, and simple set-up, this QuickCam puts you in visual control. And with true 640x480 pixel resolution you'll see the difference with every smile.

- Digital Zoom
- Video resolutions up to 640 x 480
- Still Images up to 640 x 480
- USB Interface

\$175 (LOQ204S)



ClickSmart 510

The versatile and powerful ClickSmart 510 uses its digital camera and camera. With Logitech's QuickSync one-touch downloading, you'll be sharing pictures and videos with friends and family over the Internet right away.

- Up to 1.3 megapixel picture resolution
- Built-in microphone and flash
- Removable 8 MB SmartMedia memory card
- Make video calls
- Add live images to your instant messages
- Use it as a video security monitor
- Download images to your PC with one click

\$165 (LOQ204)



Mp3 Players

Portable Mp3 Player

- Tiny (A little larger than the size of your thumb)
- USB Interface with Flash Memory
- Mp3 and WMA playback
- Display: 8000000 Matrix
- Power: 1.5AA Battery
- Digital Noise Reduction
- Blue backlight



64M \$199 (MACE000)

128M \$299 (MACE003)



Creative Nomad Muvo

If you are looking for a great sounding tiny MP3 player with superior flexibility to store any files quickly and easily then the NOMAD® Muvo™ is right for you! With its unique 2-piece design, this tiny hybrid player offers fantastic sound quality as an MP3 player and unparalleled versatility as a USB data storage device. The NOMAD® Muvo™ is so uniquely compact it can fit virtually anywhere. Imagine storing 32 hours of digital music or over 44 floppies worth of data on your key chain!

64M \$295 (MACE000)

128M \$389 (MACE009)



All in one Mp3/VCD

- Plays MP3 CD, Audio CD, VCD, CD-R, CD-RW
- Anti-Shock Protection
- PAL/NTSC Switchable OSD
- Step-Stop Motion Playback
- Full Featured LCD display
- Infrared Remote
- Charge Function for Rechargeable Battery



\$249 (MACE002)

12

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10:00-4:00 weekends

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9:00-7:00 thursday
10:00-4:00 weekends

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Fax: 02 9267 5042 sales@adelong.com.au

Sound Cards

Games Surround
Fortissimo III

Hercules is thrilled to announce the launch of Gamesurround Fortissimo™ III 7.1, the first offering in its revolutionary new 7.1 channel sound card range.



- Cirrus Logic Soundfusion CS4630
- Sensaura 3D Engine
- 20-bit quad output
- 18-bit dual stereo input codec
- Dolby Digital™ & Dolby Digital™ EX™
- Front/Rear/Center/LFE output
- Digital S/PDIF (optional)

\$99
MMG10002

Game Surround
Muse XL

- Cirrus Logic Crystal 4630 Soundfusion Audio Processor
- Full-Duplex Hardware Record & Playback @ up to 48 kHz
- 64B DLS Synthesizer
- 64 Voice Hardware Waveable Engine
- 16-bit Recording/20-bit

\$79
MMG10012

Videologic Sonic Fury



- Cirrus Logic Crystal 4630 Soundfusion Audio Processor
- Full-Duplex Hardware Record & Playback @ up to 48 kHz
- 64B DLS Synthesizer
- 64 Voice Hardware Waveable Engine
- 18-bit Recording/20-bit Playback
- 5.1 Channel Audio Output
- 5 Year Warranty

\$225
MM10007

Creative Audigy 2 Platinum



Sound Blaster Audigy 2 delivers high-quality multi-channel recording and playback at up to 24-bit/96kHz and is the first PC product to offer playback of Advanced Resolution DVD-Audio at an astonishing 24-bit/192kHz with a stunning Signal-to-Noise ratio of 106dB

- Sound Blaster 24-bit audio
- THX®-certified & Dolby digital EX
- 6.1 Surround Sound
- 24-BIT/ 96 kHz recording
- EAX® advanced HD™ gaming
- Audigy internal drive for firewire, analog digital ports

\$675
MMCKE594

Creative Sound blaster
Live DE
\$79
MMCKE572

Creative Audigy 2
\$325
MMCKE567

Creative Extigy

THE SIMPLE, PLUG-IN AUDIO ENHANCEMENT FOR THE DESKTOP AND NOTEBOOK PC
Creative® Extigy™ is the revolutionary external quality audio solution from Creative®. Designed to provide stunning digital audio to notebook or desktop users who cannot open their PCs or would prefer not to.

- Connect to any PC with USB
- A remote control is standard.
- 24-bit DACs and a 100dB signal-to-noise ratio



\$349
MMCKE592

Speakers

Altec Lansing AVS500

The compact AVS500 is a solid entry-level surround system that will instantly improve the way you PC sounds.

- 4.1 Channel Speakers
- 6.5W RMS Subwoofer/2.2W RMS per Satellite
- 170W RMS Total Power Output
- 40Hz - 22kHz Frequency Response
- Built in controls



\$139
MMAL701

Altec Lansing AVS 300 (2speaker + Sub) **\$79**
MMAL705

AVS 2100/5100

Whether you're watching movies, playing games or listening to music on your PC, you demand big sound. Two- and three-speaker systems just don't cut it. The Altec Lansing 5100 was designed for audio fanatics like you.

- 5.1 Channel Speakers
- 22.5W RMS Subwoofer/7.0W RMS per Satellite
- 75W RMS Total Power Output
- 22Hz - 22kHz Frequency Response
- Full-Function Digital Controller
- Headphone Jack, Auxiliary Input Jack



\$395
MMAL7021

Altec Lansing 2100 (2speaker + Sub) **\$215**
MMAL7017

Altec Lansing 641

Our Ultimate 5-piece system immerses you in breathtakingly powerful sound. A dual-port subwoofer delivers deep, sustaining bass that brings your favorite games to life. If you're serious about gaming, this system will blow you away.

- 5.1 Channel Speakers
- Magnetic shielding
- Satellite mounted audio controls
- 29W RMS Total Power Output
- 70Hz - 18kHz Frequency Response



\$475
MMAL7020

Altec Lansing 621 (2speaker + Sub) **\$215**

Creative Travel Sound

Compact, lightweight and foldable, Creative® TravelSound™ speakers are so convenient to bring along on your travels. It features slim Titanium Micro Drivers for enhanced audio. Couple that with the digital amplifier that gives you power without zapping your battery life.

- 320W/11.25oz (with batteries)
- 154mm(L) x 65mm(W) x 50mm(H)
- Includes a universal power adapter
- a handy carrying case
- a USB cable and
- a 3.5mm stereo-to-stereo cable



\$CALL
MMCKE590

Creative Inspire 5300

Creative Inspire™ 5.1 5300 adds Dolby® 5.1 home-theater quality audio to your movies, music and games.

- 18W RMS Subwoofer/6W RMS per Satellite
- Compact Satellites/High Performance Drivers
- 5.1 Channel Speakers
- Magnetic shielding
- Wired volume control with power switch
- 47Hz - 20kHz Frequency Response



\$275
MMCKE504

Creative Inspire 5700

Experience the full power of Dolby® Digital 5.1 and DTS® technologies right in your home with the Creative Inspire™ 5.1 Digital 5700. The decoder amplifier provides the most comprehensive control to your set-top DVD player, console station or your PC.

- 30W RMS Subwoofer/7W RMS per Satellite
- DTS and Dolby Digital 5.1 certified
- Magnetic shielding
- Remote control with power switch
- 35Hz - 20kHz Frequency Response



\$699
MMCKE508

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Adelong Computers



Skymaster - Storage

Skymaster External Hard Drive

- Integrated power supply
- Includes Power Cable
- Includes FireWire/USB 2 Cable
- Compatible with Windows 98/ME/2000/XP
- Compatible with Mac OS 8.6/9.x/10.x
- (W)162 x (H)36 mm
- Weighs 1.5kg including Cables



PC & Mac Compatible

	FireWire	USB 2*
40GB	\$299 HEAD000	\$299 HEAD006
60GB	\$335 HEAD001	\$335 HEAD007
80GB	\$355 HEAD002	\$355 HEAD008
120GB	\$455 HEAD009	\$455 HEAD011
160GB	\$679 HEAD010	\$679 HEAD012

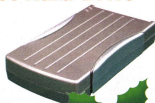
*USB 2 Hard Drives are backwards compatible with USB 1.1 ports, however, transfer rates will be limited to USB 1.1 specifications.

Skymaster Pocket Hard Drive

PC & Mac Compatible

FireWire/USB 2 Combo

10GB	\$299 HEAD013
20GB	\$355 HEAD014
30GB	\$445 HEAD015
40GB	\$495 HEAD016



- Weighs 500g
- (W)79 x (L)143 x (H)23.5 mm
- FireWire & USB 2 Cables Included
- Compatible with Windows 98/ME/2000/XP
- Compatible with Mac OS 8.6/9.x/10.x

PCI to Firewire



Capture your digital video or attach your high speed storage devices quickly & easily with the PCI to FireWire Adapter.

\$79 CC2EN039

PCI to USB2



Connect all your USB 2.0 devices to this easy to install adapter. 100% backward compatible with all USB devices.

\$55 CC2EN043

PCI to USB2/Firewire



Connect all of your USB, USB 2 & FireWire peripherals to a single card.

\$199 CC2EN041

PCMCIA Firewire

Capture your digital video or attach your high speed storage devices quickly & easily with our PCMCIA adapters.



USB 2.0 **\$99** CC2EN049

FireWire **\$125** CC2EN043

USB 2 Card Reader

- USB 2.0 AND 1.1 compatible
- Reads IBM MicroDrive & Compact Flash Cards
- Drives Support Under Windows 2000/ME/XP
- PC & Mac Compatible
- Compact Design With No Cables Required

\$79 MM2EN052



7 in 1 USB Multicard Reader **\$45** MM2EN038

Ext USB Floppy

- Compact & portable design
- Plug & Play, Hot swappable
- No external power required (Bus powered mode)
- USB interface
- Supports both PC & MAC



\$99 FD2EN000

Skymaster - Network

10/100 PCI Network Card



- Single RJ-45 connector
- Auto detection of network speed
- Plug-n-Play independent of the CPU speed.
- Support half and full duplex operation.
- Low Ethernet Command Processing Overhead.
- 32-bit Memory addressing
- Multi-thread operation.

\$25 NN2EN021

USB to 10/100 Network Adapter

Conveniently add a network card quickly & easily

- Compatible with: Windows 98 Windows Millennium Edition Windows 2000 Professional

\$95 OS2EN041



PCMCIA Network Adapter

Connect your notebook computer to a 10BaseT or 100BaseTX network in just minutes. The 10/100 PC (PCMCIA) Card will allow you to share files, printers, Internet connections and more.

- Low Power Consumption
- share files, printers, Internet connections



\$88 NN2EN018

Internet Gateway

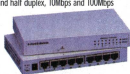


\$220 NN2EN020

- Share DSL Cable or Dial Up
- Built-in Firewall & Print Server
- Built-in 4 Port 10/100 Hub
- Simple 10 Minute Set Up
- Compatible with: Windows 9x/ME/XP/2000 Mac OS 9.x & Above Linux/Unix Distributions

10/100 Network Switch

Auto-negotiation on all ports to match the speed of the attached devices NWay switch ports support full and half duplex, 10Mbps and 100Mbps connections Automatic polarity correction Small foot-print Non-blocking performance Plug-n-play installation



5 Port **\$59** NN2EN030
8 Port **\$79** NN2EN027
16 Port **\$199** NN2EN028

Networking

Dlink DFE-538TX

DFE-538TX Fast Ethernet adapter is a high-performance auto-sensing 10/100Mbps dual-speed adapter for the PCI bus with Wake-On-LAN (WOL) feature - a power management function that supports sleep mode and power-on control from remote location.

\$35

FWDL007

PCMCIA 690TXD Cardbus, direct port

The DFE-690TXD is a 32-bit Cardbus 10/100Mbps Milly Ethernet PC Card with a built-in connector, allowing direct plug-in for a RJ-45 LAN cable to a laptop and notebook computers.

**\$115**

FWDL047

Dlink IP Router 704P

The D-Link DI-704P is an Ethernet Broadband Gateway with a built-in four-port switch plus a print server function. The DI-704P is equipped with four 10/100Mbps Fast Ethernet ports and a bi-directional LPT port to support a direct printer connection. The DI-704P's integrated Router and Firewall provide NAT, DHCP, and packet filtering services between the local network and the Internet. Built In Client for telstra cable.

**\$235**

FWDL070

Seven Port version of the 704P

DI 707P \$299

FWDL070

Dlink DSL-504



The D-Link DSL-504 DSL Router with 4-Port Switch is the easiest way to share your high-speed DSL Internet connection. With 128MB of integrated SDRAM for routing tables and MAC address translation, the DSL-504 provides all of the benefits of a high-end business router. At the heart of the DSL-504 is a built in ADSL modem that provides blazing fast Internet access over a regular phone line.

DSL-200 USB DSL Modem \$195

FWDL006

DSL-300 Ethernet DSL Modem \$315

FWDL007

DSL-500 Router/DSL modem \$375

FWDL008

Airplus DWL-520+

The DWL-520+ is a powerful 32-bit PCI adapter that installs quickly and easily into desktop PCs. When the DWL-520+ is connected to standard 802.11b devices, transfer rates can be up to 2076 kbps. When connected to other D-Link AirPlus products, the performance is even greater - up to 22Mbps!

**\$199**

FWDL093

Airplus DWL-650+

The DWL-650+ is a powerful 32-bit Cardbus Adapter that installs quickly and easily into laptop PCs and when used with other D-Link AirPlus products automatically connects to the network.

**\$145**

FWDL092

Dlink DI-614+

The DI-614+ is ideal for those creating their first wireless network, as well as for more advanced users looking for additional management settings and policy-based content filtering. An integrated 4-port switch allows direct connection of up to four computers. Several wireless clients can also securely connect to the network using 64, 128, or 256-bit encryption.

**\$455**

FWDL079

Dlink DWL-900AP+

The D-Link Wireless DWL-900AP+ is an enhanced 802.11b Wireless Access Point. The DWL-900AP+ is fully compatible with the IEEE 802.11b standard making it interoperable with all existing 802.11b compliant devices. The DWL-900AP+ also features 256-bit WEP encryption for a higher level of security for your data and wireless communications.

**\$299**

FWDL080

Airpro DWL-A520

At 54 Mega bits per second (Mbps), the D-LinkPro 5GHz DWL-A520 highspeed wireless PCI adapter delivers unsurpassed performance. With IEEE 802.11a standard compliance, the D-LinkPro DWL-A520 highspeed wireless adapter is designed for indoor use and provides excellent network scalability.

**\$489**

FWDL091

Airpro DWL-A650

The DWL-A650 has a type II PCMCIA interface to provide a slim line design and maximize efficiency. At 54 Megabits per second (Mbps), the D-LinkPro DWL-A650 5GHz highspeed wireless Cardbus adapter delivers the fastest standards-based wireless technology in the industry. With IEEE 802.11a standard compliance, the D-LinkPro DWL-A650 high-speed wireless adapter provides excellent network interoperability.

**\$445**

FWDL092

Dlink DWL-5000AP

The D-Link AirPro DWL-5000AP connects computers to 802.11a wireless adapters in a wireless local area network. A typical installation in the home involves connecting the DWL-5000AP to a Residential Gateway to share a broadband connection - Cable or DSL - to computers with installed 802.11a wireless adapters. The D-Link AirPro DWL-5000AP has a 10/100Mbps port to allow connection to an existing "wired" network.

**\$995**

FWDL083

Cases

ADELONG M71 ATX



4 x External 5.25" Bays
1 x External 2.5" Bays
Front USB
W: 200mm
D: 491mm
H: 422mm
Power Supply: 300W ATX

\$79

CAGD092

ADELONG 9001 ATX



4 x External 5.25" Bays
2 x External 2.5" Bays
Front USB & Audio In/Out
W: 200mm
D: 491mm
H: 422mm
Power Supply: 300W ATX
Black also available

\$79

CAGD094

ADELONG 3004 ATX



3 x External 5.25" Bays
2 x External 2.5" Bays
W: 195mm
D: 445mm
H: 430mm
Power Supply: 250W ATX

\$55

CAGD096

Cool Master Case



W: 210mm
H: 54.5cm
D: 46cm
Drive Bays: 4 x 5 1/4", 6 x 3 1/2" (include 2 external)
Power Supply: no power supply
Case Fans: 2 front fan holder 1 back fan holder, hdd fan holder build in (for 3 hdd only)
Door: front door with lock for cover 4 x 5 1/4", 2x3.5" drive and power switch.
Weight: 13kgs

\$265

CAGC000

Adelong Mini Server Case



W: 224mm
H: 436mm
D: 500mm
Drive Bays: 8 x 5.25" (1 Internal)
5 x 3.5" (4 Internal)
Power Supply: 400 Watt ATX
2 Additional cooling fans
Also available in charcoal

\$159

CAGD095

Power Supplies



200W AT POWER SUPPLY **\$39** PSEGN000
300W P4 ATX POWER SUPPLY **\$55** PSEGN003
350W P4 ATX POWER SUPPLY **\$58** PSEGN011
400W P4 ATX POWER SUPPLY **\$89** PSEGN015
500W P4 ATX POWER SUPPLY **\$175** PSEGN017



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Miscellaneous

USB HUBS

4 Port USB 1.1 Hub



\$55 MSAD363

7 Port USB 1.1 Hub



\$75 MSAD362



USB to Printer Cable
Compatible with Windows
95/98/2000

\$55 MSAD36160



USB Serial Adapter
Windows & Mac Compatible

\$65 MSAD36142



USB to PS/2 Adapter
Windows & Mac Compatible

\$55 MSAD36212

CoolerMaster CPU Cooler

Suitable for Socket A &
Socket 370 processors to
1.9GHz

\$29 MSAD36041



JustCooler CPU Cooler

Ultra-Quiet CPU fan
suitable for Socket A &
socket 370 processors
up to 250C

\$35 MSAD36042



JustCooler FC-900L

JustCooler FC-900L Central System Cooler.
Extracts heat from the centre of your PC

\$35 MSAD36015



JustCooler HD-600

JustCooler HD-600 Hard Drive Cooler. Keeps your hard drives cool & dust free

\$25 MSAD36003



80mm Case Fan. Adds additional cooling to your PC

\$9 MSAD36010

I/O Expansion Cards



PCI Printer Card

\$39 CGEN002



Dual PCI Printer Card

\$45 CGEN007

PCI One High Speed Serial Port Card

\$49 CGEN006

PCI Two High Speed Serial Port Card

\$55 CGEN009

TEKRAM DC-315U Ultra SCSI Card



\$49 CGEN009

3.5" Floppy Drive



\$29 FGPM003

56K V.90 MODEM



Internal PCI **\$35** FMGN002

External Serial **\$89** FMGN003

External USB **\$75** FMGN003

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Address: _____ Postcode: _____

Phone Required: () _____ Fax: () _____

Code	Description	Qty	Price

Payment by: Cheque ☐ Mastercard ☐ Bankcard ☐ Visa ☐ Amex ☐ Total _____

Card No: Expiry /

Cardholder's Name: _____ Signature: _____

Billing Address: _____

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* all deliveries include insurance

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clearance. Goods ordered by fax or post will be charged at the current price on the day of receipt. Orders can be made by phone, fax, by visiting one of our showrooms or via our web site. Deposits are not refundable.
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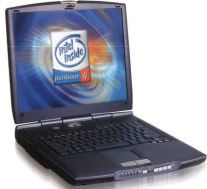
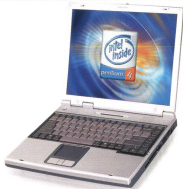
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